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THE

DENTAL COSMOS:

A

MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

Observe — Compare — Reflect — Record.

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CONTENTS OF VOLUME XLVIII.

1906.

ORIGINAL COMMUNICATIONS.

Antiseptic Washstand (An) 34
Brief Review (A) of the Prominent Pioneer Manipulators of Gold Foil 389
Case of Facial Restoration 275
Case of Regulating at Forty 920
Cleft Palate: Its Origin, Effect, and Treatment 658
Combination Plate-Obturator (A) 916
Comments on General Practice 1179
Consideration of Evidence in Scientific Investigation 1015
Consideration (A) of Some Causes of Malocclusion of the Teeth 726
Correcting Dental Irregularities by the Jackson System 1085
Criticism (A) of the Discussion upon an Essay Entitled "Is There an Ideal Occlusion in the Human Jaws?" 545
Crown and Bridge Work 921
Cysts of the Oral Cavity: Ranula 905
Dental Education from a New Standpoint 739
Diagnostic Value of Central Facial Line 1200
Easily Constructed Porcelain Crown (An) for Molars 156
Empyema of the Maxillary Antrum: A Statistical Study 831
Empyema of the Maxillary Sinus 661
Errors in Dental Education 731
Ethics 409
Etiology and Treatment of Acute and Chronic Empyema of the Antrum of Highmore 1
Faulty Methods in Teaching and Study. 743
Few Dental Writers (A) of the Eighteenth Century 422
Forces Employed in Condensing Gold Foil in Cavities of Teeth 671
Fractures of the Jaw 1195
Fractures of the Maxillary Bones, and *Résumé* of Forty-three Cases 828
Gold as a Filling Material 151
Gold Inlays for Bridge Anchorages; also Hood Abutments 721
Human Skull (The) Used as a Gnathodynamometer to Determine the Value of Trituration in Mastication 1189
Hyperacidity of the Saliva: Some Causes and Some Effects 143
Impaction of the Third Molar, and the Use of the Elevator in its Removal.. 421
Is Oral Cleanliness the Chief Factor in the Prophylactic Treatment of Dental Caries? 1100
Is There an Ideal Occlusion of the Teeth in the Human Jaws? 24
Maxillary Fractures 29
Metabolism as a Connecting Link Between Dental Surgery and General Medicine 1093
Metallic Shell Inlays 668
Method of Making an Open-face Crown. 747
Method of Producing the Natural Contour of Artificial Teeth on the Lingual and Palatal Surfaces of Artificial Dentures 551
Mouth-Breathing 998
Multiple Infection Following Extraction of Abscessed Teeth 139
Necessity (The) for and a Method of Preserving the Integrity of the Interproximal Space 399
New Bridge Abutment (A) for the Anterior Teeth 402
New Porcelain Crown (A) 146
Nomenclature of Orthodontia 135
Obstetrical Deformity of the Mandible. 257
Orthodontia 278
Orthodontia as Applied to the Extraction of an Impacted Third Molar.... 1092
Parallelogram and Polygon of Forces Showing the Factors Involved in the Maintenance and Overthrow of the Articular Equilibrium of the Teeth in the Dental Arches 748
Perfect Retention for Gold Inlays 27
Physical Methods in the Practice of Dentistry 1193

Pioneer Dentistry in New York: an Historical Study 981
Plea (A) for Continued Effort in the Field of Dental Literature 824
Porcelain 406
Porcelain Bridges Without the Removal of the Pulp 1098
Porcelain Inlays with Special Reference to Cavity Formation 821
Position (The) of Dentistry in the Field of Medicine 154
Possibilities of Modern Dentistry 419
Process of Constructing a Metal Denture with Soldered Tooth-Attachments Without Subjecting the Teeth to the Flame 550
Professional Man's Disease (The) 125
Question (The) of Extraction in Orthodontia 373, 521
Rational Treatment of Putrescent Pulps and their Sequelæ 537
Readily-Made Matrices and their Application 35
Recent Work with the X Ray and High-Frequency Currents in the Diagnosis of Dental Cases and in the Treatment of Pyorrhea and Cancer 637
Relation of Circulatory Diseases to General Anesthesia 813
Removable Backings in Crown and Bridge Work: Another Method 656
Removable Post (A) as Fast and Strong as an Irremovable One 1192
Report of a Case of Double Resection for the Correction of Protrusion of the Mandible 817
Restoration of Gum Tissue on the Labial Aspect of Teeth 927
Restoration of the Functions of Mastication Subsequent to the Removal of Portions of the Mandible, Including the Temporo-Maxillary Articulation .. 416
Shall We Abandon Nitrous Oxid for Ethyl Chlorid or Somnoform? 835
Some Lesions of the Mouth with Which the Dentist Should be Familiar 651
Some Modern Thoughts Along the Line of Oral Hygiene 147
Some of the Factors that Modify the Human Jaws and Other Portions of the Face 1071
Some of the Phenomena of Colors in Porcelain Inlay Work 929
Some Phases of Crown and Bridge Work 290
Strength (The) of Porcelain when Used as a Tip or Corner 130
Surgical Treatment (The) of Chronic Alveolar Abscess 15
Symbiosis, with Particular Reference to the Bacteria of the Alimentary Canal 528
There is "An Ideal Occlusion of the Teeth in the Human Jaws" 302
Thoughts on the Development of Crown and Bridge Work: with Some Practical Suggestions 285
Tooth-brush Sterilization 912
X Ray (The) in Dentistry 260

Papers in Society Proceedings.

Cavity Preparation and the Shading and Setting of Inlays 1048
Chemical Principles Involved in Tooth-Discoloration 947
Chloasma Traumaticum of the Gingival Tissue 333
Choice (The) of Proper Filling Material 601
Control (The) of Patients 1109
Correspondent's Report (New York State Dental Society) 94, 1130
D.D.S. (The) Abroad 230
Extensive Bridging after Pyorrhea 335
Few Observations (A) 160
Gold and Tin 60
Gold Fillings *versus* Porcelain Inlays .. 1043
Higher Ideal (A) in Crown and Bridge Work 1147
Importance of Early Recognition of Epithelioma 56
Infectious Diseases of the Mouth 328
Mandibular Action: Its Influence on the Entire System 457
Need of Endowment for Dental Schools 1246
New (?) Anterior Bridge Abutment: a Chalk-Talk 488
Normal Articulation of Artificial Teeth 311
Oil Colors as an Aid in Porcelain Work 941
Oral Sepsis 593
Oral Surgery 65
Outside of Dentistry 54

Past, Present, and Future of Porcelain in Dentistry 479
Plea (A) for Proper Appreciation of Occlusion 684
Practical Talk on Orthodontia........ 1233
President's Address (National Dental Association) 200
President's Address (Pennsylvania State Dental Society) 1142
Pressure Anesthesia 759
Proposition (A) for a Dental History.. 687
Regeneration (The) of Dental Prosthesis 862
Report of the Committee on Practice (New York State Dental Society) ... 87
Report of the Committee on Scientific Research (New York State Dental Society) 187, 1029
Review (A) of the Question of the Treatment of Putrescence as Related to Pulps and Pulpless Teeth....... 463
Some Attachments for Crowns and Bridges 755
Some Observations upon the Obscure Etiology of Pyorrhea Alveolaris..... 473
Specialization in Dentistry 935
Status of the Profession............ 1214
Three Years' Service in the Philippines. [Abstract.] 208
Use of Compressed Air in Operative Dentistry 588
Uses of the X Ray in Dentistry. [Abstract.] 591
X-Ray Demonstration 1237

CORRESPONDENCE.

Dentinitis from Diabetes.............. 1106
Dentistry on the Portuguese West Coast of Africa......................... 673
Ethyl Chlorid as an Anesthetic: Remarks on Dr. Friedland's Statements 1022
Fracture of the Mandible from Gunshot Wound 840
"Interstitial Gingivitis" 553
Nitrous Oxid and Ethyl Chlorid....... 1207
Oldest Dental Society (The).......... 934
On the New Method of "Removable Bridge Work" 306
Pending Army and Navy Dental Bills (The) 1104
Polishing Ground Surfaces of Porcelain Teeth 934
Recent Fatality (The) under Anesthesia: a Correction 934
Removing Pins from Root-canals....... 1208
Stubborn Case of Dentinitis 840
Union Meeting of South German and Swiss Dentists 750

PROCEEDINGS OF SOCIETIES.

Connecticut State Dental Association 946, 1214
Dental Society of the State of New York 87, 187, 1023, 1130, 1209
District of Columbia Dental Society and the Maryland State Dental Association 333, 488, 587, 859
First District Dental Society, State of New York......65, 170, 342, 478, 574, 681
First District Dental Society (N. Y.) and New York Odontological Society. 568
International Dental Federation 100
Maryland State Dental Association—Clinics 841
Maryland State Dental Association and the District of Columbia Dental Society 333, 488, 587, 859
Massachusetts Dental Society ...53, 182, 1246
National Dental Association 200
  Section I 307
  Section II 426
  Section III 453
  Clinics 554
New York Odontological Society, 568, 675, 767, 862, 1109
New York Odontological Society and the First District Dental Society (N. Y.) 568
Northeastern Dental Association....... 683
Pennsylvania State Dental Society, 38, 158, 605, 1142, 1228
Seventh and Eighth District Dental Societies of the State of New York, 751, 850, 935, 1043

EDITORIAL.

Concerning Anesthetics in General and Cocain in Particular 1256
Concerning Hobbies 494
Corrections—
  Dr. D. M. Hitch's article on "Tooth-brush Sterilization" 1056
  Dr. Herbert L. Wheeler's article on "Is There an Ideal Occlusion?".. 496
  Tooth-bleaching by Hydrogen Dioxid 1056
Dental Education 780
Dental History 352
Dental Legislative Movement (The) in Australia 872
Destructive Critic (The) 690
Ethics and Professional Progress 1157
General Pathological Significance of Pericemental Inflammations 956
Henry Martyn Lewis 244, 349
In re San Francisco 693
Notice—To Members of the Lewis and Clark Dental Congress 1057
Passing (The) of the *International Dental Journal* 242
Repeating Tendency (The) in Dental History 104
San Francisco Dental Relief Fund—Contributions through COSMOS.......... 877
Sauce (The) to the Pudding 1053
Who is My Brother? 608

BIBLIOGRAPHICAL.

American Text-book of Operative Dentistry 108
Anatomy, Descriptive and Surgical 497
Atlas and Epitome of Dentistry 1261
Dentist's (The) Magazine 498
Developmental Pathology 355
Manual (A) of Mechanical Dentistry and Metallurgy 879
Manual of Operative Surgery 497
Modern Mastoid Operation (The)..... 695
Orthodontia; or Malposition of the Human Teeth: Prevention and Remedy.. 610
Teeth (The) and Their Care.......... 1264
Traité Théorique et Pratique des Couronnes Artificielles et du *Bridge Work*. 354
World's (The) Anatomists 497

REVIEW OF CURRENT DENTAL LITERATURE.

Acute Poisoning with Tincture of Iodin 612
Acute Sinusitis of the Face 110
Alloys and Amalgams 358
Alopecia Areata of Dental Origin..... 611
Anesthetic Properties of Magnesium Sulfate 613
Assumed Innocuousness (The) of the Ethyl and Methyl Derivatives 788
Avulsion of the Terminal Branches of the Trigeminal Nerve for the Cure of Trifacial Neuralgia 360
Blue-Light Analgesia 501
Calculus in Wharton's Duct Complicated by Suppuration with Involvement of the Submaxillary and Sublingual Glands 358
Capping of the Pulp 786
Care of the Mouth and Teeth 245
Case (A) of Death Following the Extraction of a Tooth under Cocain and Adrenalin Anesthesia 1061
Case (A) of Delayed Eruption 699
Case (A) of Dental Ankylosis (Synostosis) 697
Case of Healing of Comminuted Fracture in Root of Central Incisor 963
Case (A) of Hypertrophy of the Gum.. 113
Case of Persistent Post-Extraction Hemorrhage Treated by Reimplantation.. 1162
Contribution (A) to the Study of Black Tongue 1163
Curious Case (A) of Mercurial Intoxication Caused by an Amalgam Filling.. 112
Cyst of the Antrum 786
Cysts of the Maxilla of Dental Origin.. 499
Death of an Infant Following the Extraction of a Congenital Tooth 1165
Dental Caries and the Nature of the Saliva 357
Dental Irregularity in a Syphilitic..... 961
Differential Diagnosis of Trigeminal Neuralgia 791

Dionin 788
Disinfection of the Mouth 695
Disorders and Diseases of the Heart in Relation to Anesthesia for Dental Operations 882
Easy Way (An) to Repair a Broken Facing 964
Etiology of Noma 1269
Explosion with Sodium Dioxid 359
Extensive Necrosis and Secondary Fracture of the Mandible of Dental Origin 696
Extensive Necrosis of the Mandible of Tabetic Origin 881
Facial Paralysis Following the Extraction of a Number of Roots 356
Fatal Intoxication with Small Doses of Potassium Chlorate 359
Fetor of the Breath 611
Few Experiments (A) with Alypin 356
Formic Aldehyd 114
Hemophilia. [Abstract.] 1267
Hemostatic Mixture 1165
Hemostatic Properties of Potassium Permanganate 1162
Hyperhidrosis Caused by Mastication 249
Hypertrophy of the Gums 1165
Infections of the Newborn: Buccal and Salivary 110
Influence of Mastication on Cerebral Circulation 881
Investigations on the Consolidation of Implanted Teeth 1058
Method of Obtaining Plaster Casts of the Face 615
New Anesthetic (A): Novocain 882
New Way to Apply Cocain in Dental Practice 1264
Osteoclasts in Dental Caries: Process of Tooth-Destruction at the Carious Zone 358
Picric Acid in Dental Therapeutics 884
Plea (A) for Antiseptic Mouth-washes 1260
Post-Extraction Treatment of the Alveoli 613
Presence (The) of Non-striated Muscle Fibers in the Pulps of the First and Second Molars 360
Pyorrhea Alveolaris 503
Radiculo-Dental Cysts Invaginated in the Maxillary Sinus: Diagnostic Significance and Treatment 961
Replantation of Teeth 502
Report of the Condition of School Children's Teeth 963
Resection of a Portion of the Root in the Treatment of Chronic Alveolar Abscess 698
Rôle (The) of Inflammatory Conditions of the Buccal, Nasal, and Pharyngeal Mucous Membranes in the Etiology of Tuberculous Infections 112
Simple Method of Diagnosing Incipient Stomatitis in the Course of Mercurial Treatment 1162
Solidified Formaldehyd in the Treatment of Putrescent Pulps 614
Stanno-Percha: A Combination of Tin and Gutta-Percha for Filling Purposes 112
Sterilization of Solutions of Cocain Hydrochlorid 111
Stomatitis 698
Stomatitis in Children 789
Study (A) in the Signs of Degeneracy 880
Syphilis of the Maxillæ in its Relation to Diseases of the Dental Organs 696
Tabulation of Three Thousand Extracted Teeth 962
Teeth Devoid of Enamel 788
Thorough Mastication in the Treatment of Chronic Diseases 503
Three Therapeutic Agents 359
Tooth-Powder (A) 1165
Treatment of Actinomycosis and Blastomycosis with Copper Salts 246
Treatment of Gangrene of the Mouth (Noma) 964
Treatment of Leucoplakia 965
Treatment of Necrosis of the Jaws 246
Treatment of Pericementitis 963
Treatment of Thrush 787
Treatment of Thrush with Weak Mercurial Solutions 113
Treatment of Trifacial Neuralgia by Osmic Acid 1058
Treatment, with Lead, of Enlarged Foramina and Perforations 357
Two Cases of Salivary Lithiasis 245
Use of Vertical Clasps for the Retention of Partial Dentures 357
Voluminous Cancroid of the Cheek 612
Why Negroes Have Such White Teeth. [Abstract.] 1268

PERISCOPE.

Accurate Method of Shading Inlays ... 506
Advantage of the Gold Inlay over the Porcelain One ... 615
Advantages of the Bandless Porcelain Crown ... 250
Advantages of the Clasp ... 116
Alcohol in General and Special Therapeutics ... 252
Alloy to Solder Glass ... 506
Aluminum Plates ... 115
Amalgam Inlays ... 889
Anatomical Articulator (The) in Crown and Bridge Work ... 117
Anesthetizing the Pulp Through Occlusal Cavities in Molars and Bicuspids Without the Use of the Pressure Syringe ... 966
Annealing Platinum Matrix ... 885
Antidote for Silver Nitrate ... 1271
Antiseptic Mouth-washes ... 363
Artistic Artificial Dentures ... 507
Backing Facings and Gold Corners on Porcelain Teeth ... 888
Backing for Facings ... 1062
Backing Teeth ... 1171
Behavior of Cement under Different Climatic Conditions ... 1271
Bad Teeth Cause Rejection of Many Army Recruits ... 1273
Bending the Arch ... 1061
Beta-Eucain Lactate ... 1061
Bubbles in Porcelain ... 887
"Bulk" Shading *vs.* "Layer" Shading ... 617
Burnish Your Gold Fillings ... 1166
Burs and Mandrels and How to Care for the Handpiece ... 616
Carbolic Acid for Cleaning Cavities ... 615
Care of the Teeth during Pregnancy ... 886
Carving-wax for Crown and Bridge Work and Other Uses ... 250
Cavities in Which the Use of Porcelain is Contra-indicated and Cavities in which It May be Advantageously Used 508
Cavity Margins for Inlays ... 791
Cement as an Aid in Starting Gold Fillings ... 1171
Cement Fillings ... 505
Cement Fillings Should Overlap Cavity Margins ... 1272
Cement Linings with Amalgam Fillings 1170
Cementing the Inlay ... 967
Clean Teeth and Good Health ... 117
Coating for Plaster Casts ... 885
Cocain and Adrenalin-Cocain Anesthesia 700
Cocain Anesthesia ... 967
Colored Arsenic Mixture ... 966
Coloring Plaster Facilitates Separation 504
Constructing a Crown with a Facing upon a Platinum Base ... 702
Continued Mild Medication in the Treatment of Pyorrhea Alveolaris ... 250
Contrivance to Facilitate the Waxing-up of Plates ... 361
Controlling Alveolar Hemorrhage ... 1272
Cracking of Teeth in Soldering ... 1063
Cracks in the Enamel due to Expansion of Metallic Fillings ... 1272
Crowns ... 251
Crowns, Banded and Unbanded ... 1275
"Cry (The) of Tin" ... 616
Daily Massage of the Gum ... 115
Deaths During Scopolamin-Morphin Anesthesia ... 886
Dentin Obtundents ... 505
Desiderata (The) of a Correctly Inserted Filling ... 1167
Diagnosis of Incipient Pyorrhea ... 617
Difference in the Shades of Under- and Over-fused Inlays ... 504
Diminishing the Sensitivity of the Palate Prior to the Taking of Plaster Impressions ... 616
Disadvantages of Shell and Band Crowns ... 507
Disinfectant for Instruments ... 700
Disinfection of Hands ... 115
Easy Method of Backing ... 1171
Effective Ligature (An) ... 887
Effect of Copper Sulfate upon the Bacteriological and Chemical Constituents of Large Bodies of Water ... 250
Electro-Gilding Orthodontia Appliances. 888
Etching *vs.* Grooving ... 1272
Ethyl Chlorid for Spraying the Gums ... 966
Extracting when the Hypodermic Needle is Employed ... 1271
Facilitating the Handling of the Automatic Plugger ... 361
Feeble Sterilizing Influence of Mouthwashes ... 701
Filling Children's Teeth with Gold ... 701
Filling Material for Deciduous Teeth ... 966

Filling of Root-canals 1063
Fill the Permanent Teeth of Children with Gold 1064
Final Polishing of Plates 361
Finishing of Gutta-Percha Fillings 1166
Flask Cleaner (A) 699
Flat Cavity Seat (The) 504
Flux for Soft Solder 1272
Forms and Materials for Clasps 885
Formula for Liquid Flux 792
Fractured Upper Molars 889
General Rules in Poisoning 1063
Gold Inlays: Their Application and Construction 1167
Gold Plating 966
Gold Trimmers 1169
Good Coating (A) for Plaster Casts 362
Guide (A) in Punching Holes in Backings 1166
Halogens (The) as Antiseptics 364
Hastening the Solution of Gutta-Percha in Chloroform 115
Hasten the Setting of Impression Plates 1167
Heating-up and Soldering 1063
Hemostatic and Stimulating Properties of Bismuth Subiodid 249
Hint (A) About Soldering 886
Hint on Impression Taking 116
Hollow Gold Inlays 364
Hot Air in the Treatment of Pyorrhea Alveolaris 249
How to Apply Topical Remedies 1271
How to Avoid Porosity in Vulcanite 1170
How to Collect Spilled Mercury 504
How to Control Saliva 505
How to Cool Investment after Soldering 885
How to Deaden Noise in the Laboratory 118
How to Direct the Flame while Soldering a Bridge 885
How to Hold Cotton on Smooth Broach. 1166
How to Hold Inlay to Grind 116
How to Keep a Hypodermic Syringe in Good Order and the Needle from Corroding 1062
How to Make Hard Plaster Casts 885
How to Obtain a Roughened Surface for Porcelain Inlays 360
How to Prevent Bubbles in Porcelain 890
How to Relieve the Strain on the Porcelain While Backing Teeth 616
How to Remove Model from Articulator 700
How to Secure Proper Closure 360
How to Sterilize the Hands and Operative Accessories 968
How to Take a Bite that Must be Correct 1168
Hydronaphthol in Dental Operations 1167
Impression Material for Cases in which All the Teeth are Present 1272
Improvement of Crown and Bridge Articulator 1062
Infected Third Molar Sockets 967
Inlays Immune to Decay 616
Invisible Joints in Gum-Teeth Dentures. 1170
Iodin as a Germicide 616
Keeping Flasks Clean 885
Lead and Opium Wash 792
Limit Lines of Plates and Palatal Configuration: Vacuum Chambers 969
Local Anesthetic 361
Local Treatment of Pyorrhea Alveolaris 888
Making a Temporary Crown in Ten Minutes 251
Medical Features of the Papyrus Ebers 251
Melting-point of Gold 1169
Method of Carrying a Small Portion of Cement 886
Method of Cleaning Wax 1271
Method of Etching the Surface of a Gold Inlay 887
Method of Hardening and Protecting Plaster Casts 504
Method (A) of Making a Gold Inlay 363
Method of Making Amalgam Dies 967
Method (A) of Making Inlay to Restore the Corner of a Central or Lateral 361
Method (A) of Manipulating a Positive Matrix for Inlay Work 362
Method of Producing a Smooth Finish 1168
Method of Removing Tin from Plates 885
Method of Replacing Tooth on Vulcanite Plate 362
Method of Resetting an Upper Denture when the Bite is Satisfactory 118
Method of Securing a Better Surface for the Attachment of Cement to Solid Gold Inlay 1167
Method of Sterilizing Instruments and Appliances 1168
Method of Sterilizing Polishing and Grinding Stones 699
Method Used in Bending a Wire 504
Mineral Rather than Oil Stains for Correcting Color in Inlays 701
Mixing Amalgam on Glazed Paper 1170
Mixing Cement for Regulating Bands .. 1062
Mode of Taking an Impression Bite 968

Monochloracetic Acid as a Pulp-canal Disinfectant ... 250
Mounting of Porcelain Bridges ... 505
Mouth-wash for Sore and Spongy Gums 886
Mummifying Agents in Dental Practice ... 118
Mummifying Root-canal Filling ... 791
Necessity for Sterilizing the Mouth-Mirror ... 1064
Neuralgia and Neuritis ... 506
New and Valuable Method (A) of Making Matrices ... 618
New Mode of Sterilizing Instruments.. 118
New Solvent for Gold ... 887
Obtunder for Sensitive Dentin ... 792
Obtunding Sensitive Dentin ... 615
Occlusion for Bridges ... 966
Oil of Cajuput ... 1168
Oral Secretions ... 116
Outline of Plate ... 115
Packing Rubber ... 361
Painless Application of Corrosive Sublimate ... 1166
Perfectly Swaged Cusps ... 1271
Plaster of Paris and Paraffin Wax an Excellent Carving Material ... 115
Plastic Reconstruction of the Mandible. 889
Plea (A) for Conservative Dentistry .. 250
Point (A) in Cavity Preparation... 250
Point (A) in the Retention of Lower Dentures ... 1273
Polishing a Porcelain Crown or Any Porcelain Tooth that Has Been Ground ... 966
Polishing Rubber Plates ... 1166
Potassium Permanganate as a Hemostatic ... 887
Preparation of Cavity ... 116
Preparation of Plaster Cast and Impression Prior to Waxing-up ... 616
Preparation of the Floor of the Cap for a Porcelain Crown ... 699
Preparation of the Mouth for an Impression ... 1273
Prescription for Relief of Odontalgia... 1062
Preserve Your Models ... 1271
Preservation of Drugs from the Action of Light ... 362
Preventing Saliva and Tooth-Polishing Powders from Working Back into the Handpiece ... 886
Prevention of Bubbling of Borax ... 966
Prevention of Hypodermic Needles Rusting ... 966
Principles Governing the Finishing of Fillings ... 1170
Problem of Inlay Shading ... 117
Protection for Facings ... 699
Protective for Porcelain during Soldering ... 886
Pulp-Extirpation ... 1062
Pyorrhea Alveolaris Treated with Common Salt ... 1168
Pyorrhea Remedies ... 117
Relief of Fetid Mouth ... 1061
Removal of Coating from Instruments After Boiling ... 1167
Removal of Inlay Matrix ... 504
Removal of Rust from Instruments ... 249
Removing Bands ... 1062
Removing Pins from Roots ... 618, 1208
Renewing Zinc ... 791
Repairing Gum Section ... 361
Repairing or Adding Teeth to a Plate.. 361
Replantation of a Misplaced Tooth... 1062
Restoring Broken Crown Facings... 792
Restricting Flow of Solder ... 361
Root-canal Filling Material (A) ... 508
Root-canal Treatment ... 886
Round Burs in Cavity Preparation ... 885
Rust Preventive ... 504
Salicylic Ionization in an Obstinate Case of Tic Douloureux ... 363
Saving Time when Re-striking-up a Plate ... 360
Securing a Correct Impression... 1169
Selecting Shades ... 885
Selecting Shades in Porcelain Inlay Work ... 702
Separating Varnish ... 361
Shrinkage in Rubber during Vulcanizing ... 886
Significance of Term "Methodical"... 505
Silver Nitrate ... 363
Silver Nitrate with Cement Fillings... 362
Similarity in Tooth Tissue of Children and Adults ... 700
Soft Soldering ... 885
Softening Calculi ... 966
Soldering ... 701
Soldering of Aluminum ... 115
Some Ideas Found to be Helpful in Practice ... 888
Source of Failure (A) in Approximal Fillings ... 115
Square-end Bur in a Narrow Fissure... 700
Steps in the Process of Duplicating Plaster Models with Gelatin... 365

Sterilization of Hypodermic Needles .. 504
Sterilization of Instruments 116, 505
Successful Treatment of Sensitive Cavities 1271
Supporting a Sore Tooth while Drilling 1271
Symptoms of Alveolar Abscess; Constitutional and Local 617
Taking an Impression 1064
Taking Partial Impressions........... 1171
Temperamental Characteristics of Teeth 506
Tempering Fine Steel Instruments..... 117
Tempering Gold 1064
Temporary Dentures 615
Temporary Operation or Gold Fillings in Children's Teeth 700
Thrush or Sprue 616
Thymol in the Treatment of Abscesses.. 1166
Tooth and Nail Corrugations 251
Toothpick Evil (The) 506
Tooth-Powder Ingredients and How to Test the Purity of Precipitated Chalk 618
Transplantation of Bone for the Relief of Saddle Nose, with Report of One Case 116
Treatment for Sensitive Dentin 115
Treatment of Alveolar Abscess-with-Fistula 1275
Treatment of Chronic Alveolar Abscess through the Alveolar Plate 617
Treatment of Odontalgia by the Medical Practitioner 888
Treatment of Sensitive Palates Prior to the Taking of Plaster Impressions... 886
Treatment of Shallow Erosion Cavities. 504
Treatment of Surgical Infections...... 117
Treatment of the Gum Before Setting Crown 887
Twisting Ligatures 1166
Two Methods of Making Clasps 888
Universal Antidote (A) 507
Upper Protrusion of Deciduous Teeth.. 1166
Useful Practical Hints 361
Use (The) of Talc Supports in the Fusing of Porcelain 1166
Utility (The) of Porcelain in Large Cavities 1274
Value of the Mouth-Mirror............ 1272
View the Cavity from the Left Side.... 885
Wasteful Lot (A) 793
Watch Crystals as Medicine Containers 360
Water as a Local Anesthetic.......... 887
Waxing Together the Fragments of a Broken Plate 363
Worn Mandrels 1166
Worn-out Mandrels 360
Zinc Oxyphosphate a Preserver of Pulp-Vitality 115

HINTS, QUERIES, AND COMMENTS.

Case (A) of Replantation 890
Matrix for Pouring a Model........... 1065
Method of Removing Broken Pivots from Root-canals 890
Removing Broken Pins from Roots 1065, 1208
Retention of Porcelain Inlays......... 509
Thymophen 793, 1277

OBITUARY.

Allan, Charles F...................... 619
Beck, Charles Sidles 509, 892
Beesley, Edward M.................... 1173
Boulter, Henry H. 119
Burt, Willis Perry 891
Chapple, John Abner 703
Chittenden, Chas. C. 252, 892
Clapp, Dwight M..................... 1172
DeCrow, Warren 891, 973
Fuller, Charles A.................... 1276
Heise, Oscar N. 1066
Kay, William 973
Lewis, Henry Martyn 366
Salter, George Bell 972
Saunders, William 972
Stainton, Charles Wesley 794
Weston, Henry 970

DENTAL LEGISLATION.

Dental Law for Porto Rico 120
Dental Law for the Philippines 620

DENTAL COLLEGE COMMENCEMENTS.

Atlanta Dental College 796
Baltimore College of Dental Surgery... 706
Baltimore Medical College, Dental Department 802
Barnes University, Dental Department 799
Chicago College of Dental Surgery.... 802
Cincinnati College of Dental Surgery.. 706
College of Dental and Oral Surgery of New York 800
College of Dentistry, University of Illinois 801
College of Physicians and Surgeons, Dental Department 796
Colorado College of Dental Surgery.... 802
Detroit College of Medicine, Dental Department 894
Georgetown University, Dental Department 898
George Washington University, Department of Dentistry 894
Harvard University Dental School.... 898
Howard University, Dental Department 897
Indiana Dental College 799
Kansas City Dental College 802
Lincoln Dental College 707
Medical College of Virginia, Dental Department 897
Medico-Chirurgical College, Dental Department 896
Meharry Dental College 796
New Orleans College of Dentistry...... 803
New York College of Dentistry 896
North Pacific Dental College.......... 895
Northwestern University Dental School 893
Ohio College of Dental Surgery....... 705
Ohio Medical University, Dental Department 803
Pennsylvania College of Dental Surgery 799
Philadelphia Dental College 798
Pittsburg Dental College 897
Royal College of Dental Surgeons of Ontario 705
St. Louis Dental College.............. 804
Southern Dental College 801
State Dental College, Texas........... 798
State University of Iowa, College of Dentistry 895
University College of Medicine, Department of Dentistry 798
University of Buffalo, Dental Department 897
University of California, College of Dentistry 800
University of Maryland, Department of Dental Surgery 706
University of Michigan, College of Dental Surgery 895
University of Minnesota, College of Dentistry 894
University of Pennsylvania, Department of Dentistry 797
University of Southern California, College of Dentistry 800
University of Tennessee, Department of Dentistry 800
Western Dental College 707
Western Reserve University, Dental School 896

DENTAL SOCIETY NOTES AND ANNOUNCEMENTS.

Alabama Dental Association 369
Alameda County Dental Society....... 713
Alumni Association of Chicago College of Dental Surgery 1280
American Dental Society of Europe..122, 625
American Medical Association—Section on Stomatology, and Massachusetts State Dental Society.............513, 625
American Society of Orthodontists 625
Arizona Board of Dental Examiners 635, 1176
Arkansas State Dental Association.... 517
Army Dental Corps 255, 812, 979
Baltimore College of Dental Surgery—Alumni Association 370
Banquet to Dr. G. V. Black............ 1279
Boston and Tufts Dental Alumni Association 1176
California State Dental Association.... 370
Call for an International Mass Meeting of Dentists 1278
Canadian Dental Association 713, 903
Central Missouri Dental Association .. 1174
Central Nebraska Dental Society...... 1068
Central-Verein Deutscher Zahnärzte... 624

Chicago College of Dental Surgery.... 122
Colorado State Dental Association 903
Connecticut Dental Commissioners..635, 978
Connecticut State Dental Association, 122, 515, 810
Delta Sigma Delta Fraternity......... 977
Dental Department of Washington University—Alumni Association........ 628
District of Columbia Board of Dental Examiners 719, 1178
District of Columbia Dental Society and the Maryland State Dental Association 715
E. K. Wedelstaedt Club of Iowa....... 715
Fifth District (N. Y.) Dental Society, 515, 1067
Florida Board of Dental Examiners..519, 634
Florida State Dental Society 370, 518
Georgia State Dental Society 518, 631
G. V. Black Dental Club of St. Paul 123, 254, 1067
Harvard Dental Alumni Association.... 978
Idaho Board of Dental Examiners...519, 979
Illinois Board of Dental Examiners, 520, 1068
Illinois State Dental Society 716
Indiana Board of Dental Examiners, 123, 634, 1178
Indiana State Dental Association...... 371
Institute of Dental Pedagogics 371, 1174
International Dental Federation....... 709
International Dental Federation Commission on Military and Naval Dental Service 513
Interstate Dental Fraternity.......... 629
Iowa Board of Dental Examiners, 634, 1070, 1177, 1279
Iowa State Dental Society..........371, 810
Kansas Board of Dental Examiners.... 371
Kansas City Dental Society 514
Kansas State Dental Association...... 516
Kentucky Board of Examiners 635, 1177
Kentucky State Dental Association, 371, 517, 632
Lake Erie Dental Association.......369, 516
Leeds (Eng.) University—Ordinance on Dental Degrees 1282
Livingston (N. Y.) Dental Club 1175
Los Angeles Association of Dental Alumni 123
Louisiana State Dental Society........ 631
Maine Dental Society 632
Maryland Board of Dental Examiners, 519, 1068
Maryland State Dental Association and the District of Columbia Dental Society 715
Massachusetts Board of Registration in Dentistry 255, 718, 1070
Massachusetts State Dental Society and the American Medical Association—Section on Stomatology 513, 625
Miami Valley Dental Society 632
Michigan Board of Dental Examiners.. 1068
Michigan State Dental Association..716, 978
Minnesota Board of Dental Examiners, 372, 633, 978
Minnesota State Dental Association.... 370
Mississippi Dental Association......518, 810
Missouri Board of Dental Examiners... 519
Missouri State Dental Association..... 371
Montana Board of Dental Examiners... 719
National Association of Dental Examiners 369, 1277
National Association of Dental Faculties 626
National Capital Dental Society...... 123
National Dental Association, 711, 806, 900, 974, 1176
N. D. A. Committee on History of Dentistry 368, 1280
Nebraska Board of Dental Examiners, 636, 1176
Nebraska State Dental Society......516, 811
New England Association of Dental Examiners 632
New Hampshire Board of Registration, 519, 1069
New Hampshire Dental Society 122
New Jersey Board of Registration ..519, 1069
New Jersey State Dental Society, 518, 716, 1068
New York College of Dentistry—Class of '96 516
New York State Dental Society..254, 515, 627
North Carolina Board of Dental Examiners 634
North Carolina Dental Society........ 715
North Dakota Dental Association 371
Northeastern Dental Association....... 978
Northern Illinois Dental Society....... 977
Northern Indiana Dental Society...... 977
Northern Iowa Dental Society 977
North Nebraska Dental Association.369, 1067
Northwestern University Dental School —Alumni Association 122
Odontotechnique Society of New Jersey 255
Ohio Board of Dental Examiners...635, 1069
Ohio State Dental Society.........123, 1174

Oklahoma Board of Dental Examiners, 519, 1069
Oklahoma Dental Association 515
Open Letter to Dentists 1175
Pennsylvania Board of Dental Examiners 634, 1177
Pennsylvania College of Dental Surgery 1174
Pennsylvania State Dental Society.714, 1175
Philadelphia Dental College—Alumni Society 629
Psi Omega Fraternity 714
Public Dental Library for the City of Columbus, Ohio 1281
Rhode Island Board of Registration..635, 979
St. Louis Dental College—Alumni Association 370, 516
St. Louis Dental Society 903, 977, 1174
St. Louis Society of Dental Science.... 810
Second District (N. Y.) Dental Society 122
Seventh and Eighth District (N. Y.) Dental Societies 1067
Seventh District (N. Y.) Dental Society 369
Sixth District (N. Y.) Dental Society.. 1067
South Carolina Board of Dental Examiners 634
South Carolina State Dental Association 631, 978
South Dakota Board of Dental Examiners 123, 720, 1278
South Dakota State Dental Society.... 632
Southern California Dental Association 1067
Southern Dental Society of New Jersey 629
Southern Nebraska Dental Society.... 1068
Southern Wisconsin Dental Association 515
Tennessee Board of Dental Examiners.. 633
Tennessee State Dental Association..... 517
Texas State Dental Association.....371, 903
University of Maryland, Dental Department—Alumni Association.......... 629
Vermont Board of Dental Examiners.. 636
Vermont State Dental Society.......370, 811
Virginia Board of Examiners......... 719
West Virginia Board of Dental Examiners 718
Wisconsin Board of Dental Examiners, 124, 717
Wisconsin State Dental Society........ 716
Women's Dental Association.......... 633

Monthly Record of Patents Relating to Dentistry.

PATENTS 124, 256, 372, 520, 636, 720, 812, 904, 980, 1070, 1178, 1282

INDEX.

INDEX TO VOLUME XLVIII 1283

THE

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ORIGINAL COMMUNICATIONS.

ETIOLOGY AND TREATMENT OF ACUTE AND CHRONIC EMPYEMA OF THE ANTRUM OF HIGHMORE.

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(Read before the Milwaukee Odontological Society, October 10, 1905.)

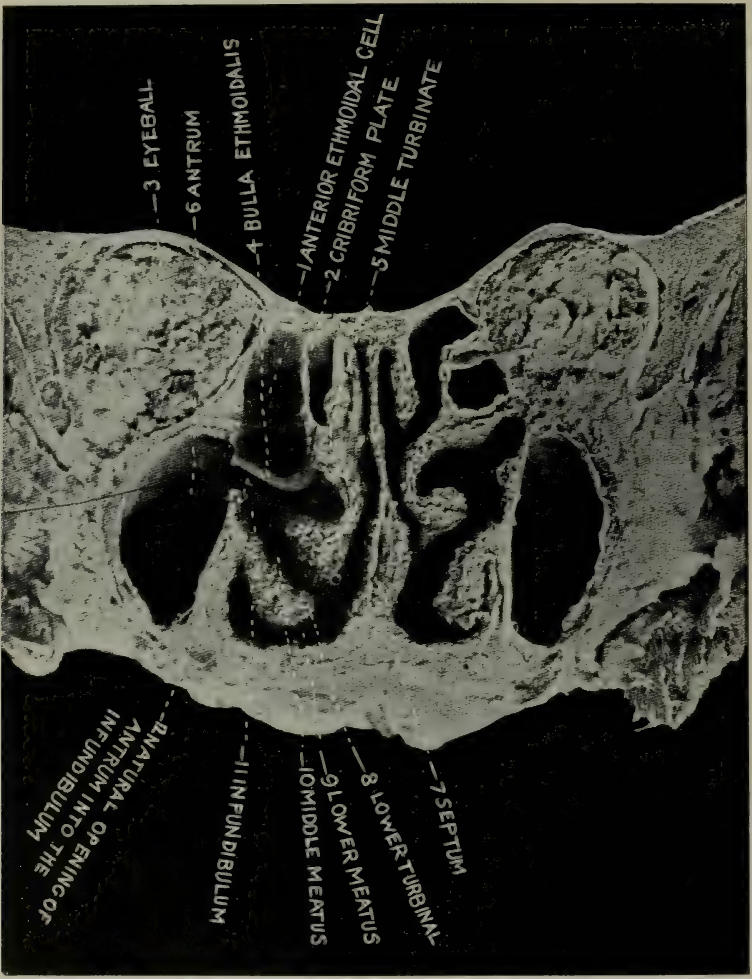
ALTHOUGH this subject has often been covered pretty thoroughly in the past, yet the various methods of diagnosis and modes of treatment have changed, *pari passu* with the greater perfection in clinical experience and advance in scientific knowledge. The antrum is a kind of boundary territory, in which both the rhinologist and the dental surgeon can display their surgical skill and experience; only the type of cases in which the one is consulted differs in the symptoms from those which come under the observation of the other. I am inclined to think that, as the antral cavity belongs to the nasal accessory sinuses, has its outlet into the infundibulum of the nose, and is in the larger percentage of cases pathologically affected by way of the nasal cavity, the nasal surgeon is working here in his own territory.

Before going into a discussion of the causes of antral abscess, I would like to emphasize some important anatomical points and pathological conditions. In early childhood there is no antral cavity. It begins to develop about the fifth year of life. It develops with the growing face by absorption of the cancellous tissues in the body of the superior maxillary bone, until by the twenty-fifth year it has reached its largest size, hollowing out the upper maxillary bone.

The antrum of Highmore resembles somewhat in form a three-sided pyramid standing inverted upon its apex, its base corresponding to the roof of the orbit. The three sides of the maxillary sinus converge at the bottom to form its floor, a broad rounded groove in which often the roots of the second bicuspids and the molar teeth, and in more rare cases even the first bicuspid and the canine tooth, with their sockets, project above the surface of the floor. The anterior or buccal wall is, medianward, around the apertura pyriformis of the nose, very thick; in the canine fossa it is very thin; more posteriorly becoming very strong and thick, forming the projecting bucket of the malar process. The posterior and external wall is convex in shape and not very thick, in close proximity to the internal maxillary artery. The anterior dental nerve, branching from the infra-orbital nerve, descends in the very thin facial wall (canine fossa), and its filaments are distributed to the incisor, canine, and first bicuspids, anastomosing with the posterior dental nerve which supplies the two bicuspids and the molar teeth.

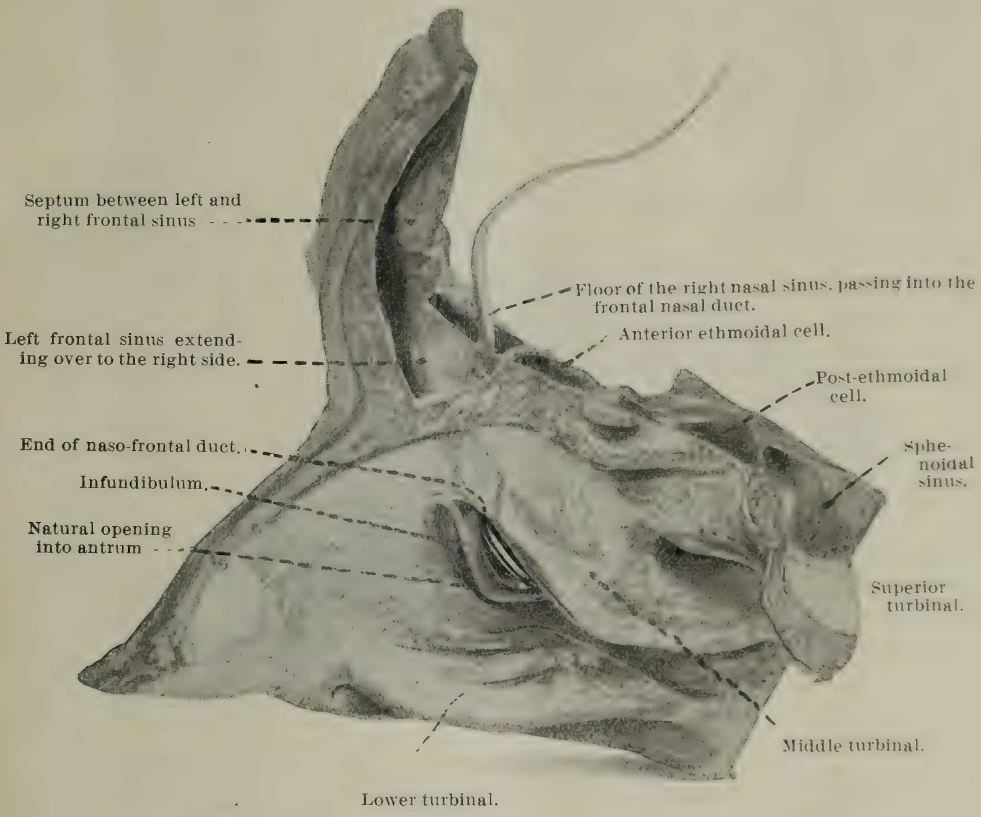
A very important anatomical factor with regard to the possibility of infection of the antrum through the diseased teeth is the fact that, according to the researches of Strubel, there is a close connection between the vascular system of the periostal layer of the antrum, the coarse-meshed vascular system of the spongy bone of the upper jaw, and finally, with the fine-meshed system of vessels of the alveoli and the roots of

Fig. 1.



the teeth. All the bloodvessels come from the same source and anastomose with one another closely. Therefore inflammation may easily travel from a diseased periosteum or a suppurating alveolar socket to the antrum without requiring a direct continuity of the surface or direct infection from one diseased area to another.

Fig. 2.


Septum between left and right frontal sinus
Floor of the right nasal sinus. passing into the frontal nasal duct.
Anterior ethmoidal cell.
Left frontal sinus extending over to the right side.
Post-ethmoidal cell.
End of naso-frontal duct.
Infundibulum.
Sphenoidal sinus.
Natural opening into antrum
Superior turbinal.
Middle turbinal.
Lower turbinal.

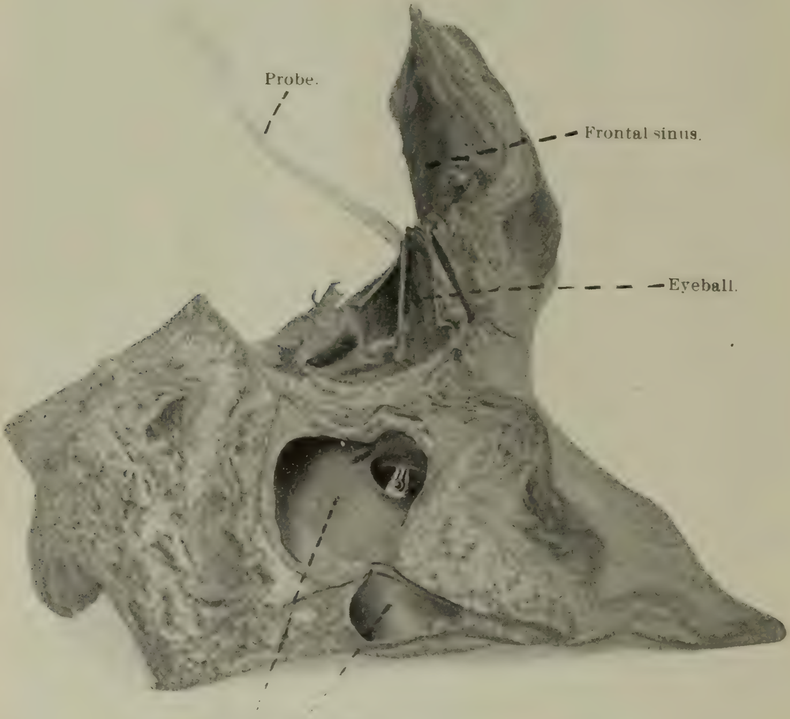
Shows the inner wall of the right antrum, or, better, the outer wall of the right nares. The silver probe, passed down from the right frontal sinus into the naso-frontal duct, appears again in the infundibulum and passes down outward through the natural opening of the antrum of Highmore into the latter. It illustrates thus the way of the pus, from the frontal sinus straight into the antrum.

The floor of the antrum and the floor of the nose (lower meatus) are nearly on the same level, a point which is of the utmost importance in removing the lower part of the inner wall of the antrum, desiring to secure free drainage from the antrum into the nose. Further, I call your attention to the existence of well-marked depressions or recesses and trabeculæ or septa between these, upon the floor and anterior wall of the antrum, which in chronic cases favor stagnation of pus. the formation of granular and polypoid tissue, or of septa of thickened connective tissue. or folds of mucous membrane—a pathological condition which requires for its eradication and cure the freest removal of the facial wall to the apertura pyriformis, and never a simple perforation through the alveolus.

The natural opening of the antrum into the nose is situated on the uppermost part of its inner wall, which is the more membranous portion, the lower part being thick and bony from the attachment of the lower turbinal. The opening runs posteriorly and inward, and enters into the middle part of the infundibulum, *i.e.* the well-known crescentic deep furrow in the outer wall of the middle meatus of the nose, which is in front and upward directly continuous to the naso-frontal duct of the frontal sinus. Of course the opening of the antrum on its highest point renders it very unsatisfactory for purposes of drainage, and gives full explanation of the pathology of the sinus.

With regard to the relation of antrum and frontal sinus diseases we must bear in mind that the antrum is directly the reservoir of the frontal sinus owing to the peculiar formation of the infundibulum. In the middle of the groove or furrow of the infundibulum there is a fold of mucous membrane extending upward and forming a pocket, at the bottom of which is the antral foramen; so that pus issuing from the frontal sinus duct and flowing down the infundibu-

Fig. 3.



Note how the silver probe, when passed through the naso-frontal duct into the infundibulum (see Fig. 2), enters with its point into the natural opening of the antrum of Highmore.

lum, or from the anterior ethmoidal cells, may run directly into the antral foramen and produce an antral abscess without being itself primarily diseased.

This point is of the greatest importance when we have to deal with the *treatment* of an antral abscess, as such abscesses could never be cured by the alveolar method (alveolar puncture), or even more extensive surgical interference, such as removal of a portion of the buccal plate (canine fossa) merely—Küster-Desault's method—as is customary in dental surgery; but only the greater rhinological operation can bring about a cure here.

PATHOLOGY OF ANTRAL ABSCESS.

The antrum is lined with a thin, closely attached muco-periosteum. Acute inflammation causes but moderate swelling and inflammatory infiltration; and in simple cases, without caries of the floor or projecting root-apices, it may remain for a long time but little thickened or altered. In most chronic cases, however, hypertrophic changes take place, and in some cases these are so considerable that the normally delicate mucous membrane undergoes enormous fibrous thickening which nearly fills the lumen of the antrum like a mass of flesh. In other cases the interior of the cavity is found partly filled with masses of granulation tissue, thickened mucous folds, collections of polypi, and cystic degenerations—the interspaces or sulci and fissures being filled out with the stagnated and putrefied cheesy pus. Oftentimes the bone becomes affected, especially the floor and its septa, producing osteophytes or caries and necrosis involving the whole floor. In extensive necrosis of the walls, or in case of ulcers of the lining mucous membrane, the suppuration may extend beyond the cavity to the orbit or the zygomatic fossa, and may produce brain abscess and meningitis. In very rare instances the whole contents of the cavity of the superior maxillary bone undergoes a sarcomatous degeneration, soon involving the inner wall of the nasal passages.

I will here mention the case of a man thirty-five years old, who, it is most probable, suffered as a boy of six an injury on his right upper jaw which, as we must suppose, gave the not fully developed second bicuspid an altered direction, and in consequence it grew and developed directly into the antrum. Later on, the roots became decayed, and the tooth fell into the cavity, and produced, as a decayed foreign body, a chronic antral suppuration, with subsequent polypous degeneration, gradually involving the infundibulum, and, as the nasal passage on this side was extremely narrow, caused by a defective septum, also involved all other sinuses except the frontal sinus. For years trials were made by specialists and general practitioners to cure the "fetid catarrh" of the nose by extracting the polypi. The polypi, of course, quickly grew again, the fetid catarrh persisted, and finally the antral cavity contents underwent a sarcomatous degeneration (angeio-sarcoma), which involved the outer wall of the antrum, the antral cavity, the whole inner or nasal wall, the ethmoidal cells, the sphenoidal sinus, the whole right nasal passage, and finally also the pharynx.

Two very extensive operations for removal of the sarcoma were performed by the essayist, and in spite of tremendous hemorrhage, which necessitated the subcutaneous infusion of four pints of normal salt solution, the patient was perfectly cured, and remained so after a year's observation.

In simple or complicated chronic antral abscess the secretion is either simply purulent without fetid odor, or in the case of fibrous or polypous degeneration of the cavity, especially if necrosis be present, intensely fetid. The amount of secretion is sometimes enormous, emaciating the patient and producing gastric disturbances and great anemia.

The pathology of the chronic antral empyema gives full explanation of the obstinacy of the disease. In the first place the antrum, in about sixty-four per cent. of cases, is not alone affected, but other nasal sinuses are diseased at the same time and keep up the empyema of the antrum. Further, in chronic cases the drainage through the natural opening is hampered by the deposits of fibrinous and cheesy clots from the stagnant pus, these solid putrefying masses blocking the outlet, which they are unable to pass, and adhering to the lining of the antrum. Further, the condition is characterized by the notorious tediousness of all suppurations in rigid walled cavities, because the unyielding walls of the antrum cannot approach and obliterate its lumen, and the lining becomes too much altered to return to its normal state. So it happens that the tendency of nature to fill up such cavity by proliferation of connective tissue results in so complete a degeneration of the mucosa, with creation of cysts, polypi, and exuberant outgrowth, that the suppuration can often only be checked by complete removal of these morbid products and the production of the freest possible drainage.

CAUSES.

As many of you are aware, it used to be the general opinion that all cases of antral abscess were caused by diseased teeth. Strubel of Dresden has, in a very exhaustive paper, studied this question, and collected the opinions of all the writers in the world's literature on this subject. He comes to this conclusion: 64.6 per cent. were undoubtedly of nasal origin; 29 per cent. of possible dental origin; 3.2 per cent. traumatic; 3.2 per cent. luetic.

With regard to the dental origin of the antral abscess, we can conclude—if the nose be absolutely sound, if influenza or the like can be ruled out, and where there is nothing to be considered except the diseased tooth or clear history of it (chronic alveolar abscess, or cysts, or alveolar pyorrhea)—it is more than probable, from the clinical standpoint, that the tooth was the cause.

Now arises the question, What diseases of the teeth may produce an antral abscess? According to the opinion of prominent dentists, a tooth with a living pulp, even if filled or crowned, may scarcely produce septic infection of the antrum; but still, with a live pulp a tooth can produce the infection through the alveolar membrane, when there is or has been pyorrhea alveolaris. All agree that dead teeth on the affected side of the maxilla, say from the canine to the second molar, or almost any tooth upon that side of the maxilla, might be a cause of infection of the antrum. But the dead tooth responsible need not, necessarily, be tender to percussion and pressure, so that it is difficult to find out the causal tooth.

The most common cause of antral infection, so far as the teeth are concerned, is that resulting from chronic alveolar abscess, chronic alveolar periostitis, cysts of the roots with purulent contents, and, more seldom, pyorrhea alveolaris. When the diseased root has done its injurious work the alveolar abscess or the periostitis may heal, and yet the antral abscess persist as an independent disease, increasing gradually in extent, the cavity being filled out with granulation tissue and polypi. The fetid pus issuing continually through the antral foramen into the infundibulum of the middle meatus produces edematous swelling of the mucous membrane of the infundibulum and surrounding parts, and later on polypous degeneration and proliferation. In that way the already narrow nose-passages become more obstructed, and the purulent discharge is gradually forced into all the other sinuses when the patient tries to free the nose-passage from the molesting discharge by blowing.

Two years ago I operated upon a patient whose history was this: Seven years before, alveolar abscess, pain and swelling in the cheek; then antral abscess; appearance of fetid catarrh in the nose-passage. After two years, total obstruction of the latter by polypi; then followed affection of the other sinuses and a total breakdown of the whole system by constant resorption of a tremendous amount of fetid pus issuing out of all sinuses, until he regained his full health by undergoing a radical operation affecting all the sinuses.

This history gives clear evidence that the dental colleague, finding as the cause of a chronic antral abscess a diseased tooth, can never effect a cure unless he has the collaborating help of the nasal specialist, whose modern diagnostic and rhinological methods prove the actual range of extension of the disease, and whose special surgery alone, in most cases, is likely to result in a lasting cure.

The value of decayed teeth as an etiological factor is often overestimated; for instance by Tilley, who figured that 90 per cent. of his antral abscess cases were caused by decayed teeth, inasmuch as 90 per cent. of his patients chanced to have decayed teeth. But as we know that a simple decayed tooth with living pulp, without affection of the alveolar membrane, without abscess or periostitis, can never produce an antral abscess. The mere coincidence of the presence of decayed teeth in many antral cases cannot be used as proof of the dental origin of the antral abscess; for then we ought to meet with antral abscess, for instance, in England or Germany or in nearly all continental countries, as a quite common disease, while, as it is, the number of antral abscesses in those countries, where nearly 80 per cent. of all adults have some decayed teeth, is in average not much larger than in the United States, where are found, owing to the excellent attention to and care of the teeth on the part of the dental profession, the healthiest and soundest teeth in the world.

With regard to traumatism as an etiological factor, I cannot deny that careless operation by a dentist sometimes causes infection of the sinus, as from forcing the root of the tooth into the sinus through fracture of the wall, in an unfortunate effort to extract, or in driving artificial crowns or bridges upon the teeth or roots, or drilling through the root into the sinus.

With regard to most common nasal infection, we know that many cases arise by infection during the course of one of the specific fevers—as, especially, influenza (grippe); in more rare cases, by scarlet fever, measles, diphtheria, typhoid fever, pneumonia, and also the common cold in the head, which is nothing else than an infection by some pyogenic germs. In all of the above-mentioned diseases the original infection of the nasal mucous membrane may extend into all the accessory sinuses, and there produce—in the suitable medium, owing to the inefficient drainage and retention of secretions—an increase of the inflammation and suppuration; or the patient himself, by violent blowing and cleansing of the obstructed nose, forces the infectious secretion into the sinuses. Also, rhinological interferences are likely to cause antral abscess; for instance, firm tamponade of the nasal passage after an operation (provided there was previously an infectious discharge in the nose); or the use of the galvano-cautery, where septic accumulations lie within the nasal cavities, the patient forcing such material into the sinus by blowing the nose.

SYMPTOMS.

Acute antral abscess. I will here mention throbbing pain in the cheek and in the supra-orbital region, flushed cheek, perhaps tenderness—upon pressure or percussion—of one or more teeth and in their immediate neighborhood, especially the region of the canine fossa; sometimes swelling and tenderness of the soft tissues of the face and cheek; mostly fever and the associated symptoms. Relief comes when the abscess bursts into the nose, or is relieved by extraction of the inflamed tooth and, if necessary, perforation through the alveolar socket. If consulted in such a case of probable antral abscess, and you do not find a diseased tooth which probably may have caused the symptoms, but can trace a preliminary acute cold, or grippe, and also purulent discharge from the nose after the acute turbulent symptoms have subsided, you may be sure the probable antrum abscess has its cause in the nasal disease.

Chronic antral abscess. In chronic antral cases you are only consulted when dental symptoms are prominent; but you will then find, at the same time, the array of nasal symptoms: offensive discharge from the affected side of the nose, frequently recurring disagreeable sickly taste, increasing difficulty in breathing through the nose due to formation of polypi, chronic nasal catarrh dropping down into the pharynx, occipital headache, brow-ache, feeling of weight over the forehead and around the eyes, impaired digestion, severe forms of gastritis due to continued swallowing of pus, impaired general condition, lack of energy, psychic depression, brought about by the absorption of the purulent material into the general circulation. Of course patients with chronic antral abscess will appeal oftener to the rhinologist, but if you are consulted in such a case, due to some dental symptoms, or you find by chance, while working on the diseased tooth, the before-mentioned group of nasal and general symptoms, under such circumstances you may reasonably entertain a strong suspicion that the antrum is chronically diseased, either alone or in combination with other accessory sinuses.

DIAGNOSIS.

I will not discuss all the diagnostic methods found useful and necessary by the rhinologist who is acquainted with the difficult anatomical structure of the inner nose. I wish to emphasize only two points which may prove to be of great diagnostic value if you should suspect an antral abscess on account of the above-mentioned local and general symptoms; for it would not be justifiable to sacrifice a healthy tooth or perforate an alveolus to make the diagnosis.

Let the patient blow his nose thoroughly upon the affected side until no pus is expelled. Then let him, with feet together, endeavor to touch his toes without bending the knees, for from one to two minutes. Extensive aching of the diseased antrum and eventually of the diseased teeth will be induced, and a stream of pus will result from renewed blowing of the nose. The rhinologist is convinced by the fact that he sees the pus streaming down from the middle part of the infundibulum over the upper surface of the middle or more posterior part of the lower turbinal.

Another fairly strong confirmation of your suspicion of chronic antral involvement will be secured by transillumination, placing a small 10-volt electric lamp into the mouth (after removal of artificial teeth and plates) in an absolutely dark room. If there be pus in the antrum—and as in all chronic cases the antrum is filled out with thickened mucous membrane, polypous and fibrous tissue—you will find, invariably, a marked infra-orbital crescent shadow in contrast to the clear transillumination of the other side. In simple antrum abscess, without change of the mucous membrane lining, you will often find no shadow.

The absolutely certain means by which you can demonstrate the presence or absence of pus, is the exploration of the cavity—either, in absolutely clear cases of dental origin, by pulling a tooth and perforating the alveolus, or by the elegantly and easily effected puncture within the nose, which is practically painless and does not need general anesthesia. This puncture is absolutely reliable, and is done with a trocar in the outer wall either of the lower or of the middle meatus, which is more easily perforated, being partly membranous (Onodi's method). The trocar is so constructed that when it is withdrawn, on the remaining cannula is fitted a rubber tube, through which warm salt solution can be injected. The second step must be to decide whether you have to deal with an uncombined or simple empyema or an empyema which is the result of the suppuration of other nasal sinuses, especially the frontal sinus.

TREATMENT.

The treatment of acute antral suppuration is simple. The painful symptoms rapidly disappear if free drainage be secured, either through a tooth-socket in the alveolus (the tooth having been previously extracted) or through a large opening of the outer wall of the nares, either in the inferior (anterior part) or the middle meatus (middle part). If anatomically possible, one can also try to syringe the antrum through the natural opening in the infundibulum; but success in this mode is attained in only about 25 per cent. of the cases. The opening in the inner or nasal wall of the antrum made by the electric bur or by trocar must be at least a quarter or half an inch in size, in order to insert a curved metal tube. After having syringed out the cavity thoroughly with normal salt solution or some mild antiseptic solution—as, especially, formalin 1:2000—it is necessary to Politzerize the antrum vigorously, again irrigate, and again dry it out by the Politzer bag. Iodoform or boric acid powder may then be insufflated. By this method, it is safe to say, any pus in the antrum will be secured. It is important to note that at the time of the operation, or at any time during the after-treatment, although the antrum may be found dry at the first Politzerization, it is not wise to consider it so, for small masses of pus, which are sources of infection and which must be removed, are often adherent to the walls. To overlook this fact renders the operator likely to consider the antrum healthy. A second irrigation and Politzerization are necessary to dislodge such masses. The dry treatment leads always to the quickest cure. Should this fail, two or three injections of saturated boric acid alcohol into the cavity will effect a rapid cure. This is also the treatment for chronic uncombined or uncomplicated cases, which we have to deal with later on. The alveolar method in acute cases is to be resorted to and leads to quick results only if we find the cause of the acute empyema to be in fact in a diseased tooth, and if we can exclude all possible nasal causative factors. Hence, also, in supposed clear alveolar cases the dentist should appeal to the rhinologist to exclude diseases of the nose: for the empyema may apparently be caused by a seemingly diseased tooth (acute symptoms), while in fact it has already been caused by chronic nose disease. In such a case drilling through the alveolus would not cure the disease.

In resorting to the alveolar method it is well to make the opening so large that we are able to insert the tube for several days, in order to facilitate the drainage and the washing of the antrum, and to keep it from closing too quickly. The tube should, as a general rule, not project more than a quarter of an inch above the level of the floor of the antrum.

Should we have a nasal etiology for the acute empyema, or any nasal complications in a case where a tooth seems to be the active etiological factor, we can only hope to cure the empyema by establishing free nasal respiration and by correcting any pathological condition that may exist. To pathological conditions in the nose belong especially hypertrophies of the turbinals, adenoids, or the remnants of them, and polypi formation and septum deflections. All these conditions act as sources of infection and re-infection. They become a continual feeder of infectious material which may find its way into any of the accessory sinuses and set up an empyema essentially chronic from the start. They act also as a preventive of free nasal respiration, and this latter is a *conditio sine qua non* in the successful intranasal treatment of antral empyema, acute or chronic.

CHRONIC EMPYEMA.

If we have to deal with chronic empyema the first question to be decided is: Have we before us a simple empyema, or a combined or complicated empyema? This question the rhinologist only can decide. He has to establish the fact of the absence of fibrous or polypous degeneration of the mucous membrane lining of the antrum, the absence of necrosis of bone in the antrum, the absence of polypous involvement of the upper membranous part of the inner wall, especially the region of the infundibulum and its adjacent parts (middle turbinal), the absence of involvement of other sinuses—frontal, ethmoidal, and sphenoidal. If none of these factors are present we have a simple chronic empyema.

Then arises the question, Is this caused by a diseased tooth? If it be answered in the affirmative, and supposing all other etiological factors and pathological conditions and complications are absent, the alveolar method of curing an antral empyema is the correct one, as only then will it yield good results.

Yet in this small number of cases some objections can be raised against the alveolar puncture. The trauma caused by forcing the drill through the alveolus may be sufficient to cause enough irritation to materially prolong the duration of the disease. From a surgical standpoint the communication with the mouth is in all cases to be deprecated, and the first step in conservative treatment should be to close such an opening. The strongest argument that can be urged in favor of this method is that it affords free egress of fluid pus already in the antrum; but the fact that it does not afford drainage even from the most dependent part of the antral floor is sufficient to show that it does not perfectly fulfill even that duty. Then, too, pus in the antrum is not always fluid. Many times it is very tenacious, stringy, and may lie fastened so firmly to the walls or roof that it is removed with difficulty, even with the forceps. The after-treatment generally employed is judicious irrigation, or the dry method is followed, in order to maintain the lumen of the opening of sufficient size, either by a wick of gauze or by a tube. The upper end of the wick of gauze, although perhaps the antrum itself may be dry, is always soaked with infected secretion very soon after its insertion, and the patient is forced for a long period to take his food flavored in a sauce of iodoform and pus. To keep the hole from closing a gold or rubber tube obturator has to be worn constantly in it. They are certainly better than a gauze wick, but owing to the irritation and pressure upon the antral floor opening, granulations will sprout about the end of the tube, and become liable to block the opening of the tube, or to form by its proliferation around the tube a wall of granulations which favors the formation of recesses, with opportunity for the secretion to stagnate and re-infect the cavity. Drainage through its easily obstructed bore is so imperfect as to be largely illusory, and the patient has to supplement it with frequent irrigations, which are only successful if the natural opening in the nose be free enough to act as a counter-drain. In spite of daily washings with antiseptic lotions, however, the discharge is apt to remain putrid, to the disgust and injury of the patient. All these annoyances make him dissatisfied with the mere palliation of his condition.

From the foregoing it is evident that we are able only in a very small number of chronic cases—of course only in uncomplicated ones—to perform a cure in a relatively short time by the alveolar method. Which methods, then, are at our disposal for curing quickly and with lasting results an uncomplicated or simple empyema of the antrum? As decidedly superior to the alveolar method we have at our disposal the intranasal methods.

Before touching upon these conservative intranasal operations I wish to emphasize one point. Before we perform any of these operations the dentist has removed and cleared up supposed causative factors of the teeth. The rhinologist has established free nasal respiration and corrected any pathological condition that may exist—implying removal of suppurating adenoids or remainders of removed ones; removal of all hypertrophied parts of lower or middle turbinals; cure of co-existing empyemata of the sinuses (ethmoidal cells, sphenoidal and frontal sinuses). This is a *conditio sine qua non.* Otherwise our work on the antrum of Highmore would be in vain. This absolutely necessary requirement refers also to the treatment of the chronic complicated antral empyemata when we have to resort to *radical* operations.

CONSERVATIVE INTRANASAL METHODS.

First: The easiest intranasal method is Onodi's operation, which we have referred to in discussing the diagnosis and treatment of acute antral abscess. We perforate with a specially constructed trocar the upper or membranous part of the nasal wall in the middle meatus, and enlarge this opening with cutting forceps large enough to insert easily for the patient, a tube into the cavity. The requisite condition is that the nasal passages are not extremely narrow from deflected septum. This operation requires only local anesthesia, inflicts but a trifling injury, and leaves the nasal interior practically intact. Many chronic antral cases are curable by this method in a very short time (ten days).

Second: For chronic cases of more severe character, where the suppuration is marked with much foul discharge, or where the long duration of the disease and the polypous proliferation of the infundibulum and the shadow in transillumination leads to a suspicion of marked degeneration of the mucous lining of the antrum, the intranasal removal of nearly the entire anterior part of the nasal wall is indicated. The operation is advocated by Rhéti (Vienna) and Claoué (Lyons). After having extracted the diseased teeth or roots as possible causal factors of the abscess of antrum, and having established normal nasal respiration, we remove the anterior two-thirds of the lower turbinal and perforate the outer wall of the lower meatus by a straight trephine driven by a motor as far forward as possible against the outer wall of the nasal cavity. A second and third core is then trephined out in the same manner, and then nearly all of the anterior two-thirds of the nasal wall of the antrum is cut away by a long barrel-shaped straight bur (advised by Freer), followed by the use of Rhodes' large punch-forceps to do the rest. The window made extends from about three-fourths of an inch behind the apertura pyriformis, in front, nearly as far back as the perpendicular plate of the palate bone behind. Below, the opening is made level with the floor of the meatus, so that no ledge remains between the nasal cavity and the sinus. In this way we have a fairly good view of the cavity, and can palpate it with the little finger. With Rhodes' punch-forceps and sharp ring curettes the whole diseased contents of the cavity are evacuated; then it is packed through the nose with strips of gauze saturated with subnitrate of bismuth for two days, as advised by Freer. After that the irrigation begins, with normal salt solution interrupted now and then by the appliance of a 2 per cent. solution of silver nitrate. The healing is complete in from one to three months.

This operation may be performed with cocain and adrenalin, and with much less traumatism than the radical external operations through the facial wall. We can guarantee that nearly 75 per cent. of chronic antral empyemata are curable by this method. The only drawback to this operation is that it does not give such an excellent free view of all conditions within the antrum as the greater external operations—which latter therefore correspond more with surgical principles. In cases of extreme narrowness of the affected nasal passage, at all events, one has to resort to the external operation, to which I am now going to refer.

RADICAL OPERATIONS THROUGH THE FACIAL WALL.

Indications are the same as for the Rhéti-Claoué operation just described, and further, in cases with extreme narrowness of the nasal passage; and again, when there is evidence of necrosis of the bone in the sinus, and if other sinuses, especially the sphenoidal sinus and the posterior ethmoidal cells, are involved. We have to deal with two different kinds of operations which have not quite the same scientific value, the Luc-Caldwell operation and Denker's operation (combination of Luc, Boeninghaus and Kretschman), which latter involves a decided progress.

(1) Luc-Caldwell operation: Tamponade of posterior nares; removal of two anterior thirds of the lower turbinal; incision in the gingival labial groove from the canine to the third mo-

lar, to the bone. Elevation and lifting upward of the periosteum to close proximity of infra-orbital foramen. Then removal of the outer facial wall in a size between a 25 and a 50-cent piece, in order to gain an absolutely free access to all corners, and maybe accessory sinuses, and to remove all septa and trabeculæ which would interfere with the freest drainage. Removal of the whole diseased contents by curette and bone forceps. Then removal of the nasal wall from floor level to the ethmoidal cells, so that the antrum represents a wide excavation of the nasal fossa, floor and floor on the same level, without any ledge between. If necessary there is removal of diseased ethmoidal cells and opening of the sphenoidal sinus according to Jansen's method and packing of the cavity for three days. Then review of the whole cavity; if necessary, removal of remainders of diseased tissue, especially in the anterior inner angle behind the apertura pyriformis. Closure of the mouth-wound by suture.

After treatment: Daily washings or irrigations of the cavity, from the nose by means of rubber tube or catheter, with normal salt solution; now and then cauterization with 5 per cent. silver nitrate or 50 per cent. argyrol solution. Perfect healing in one to three months.

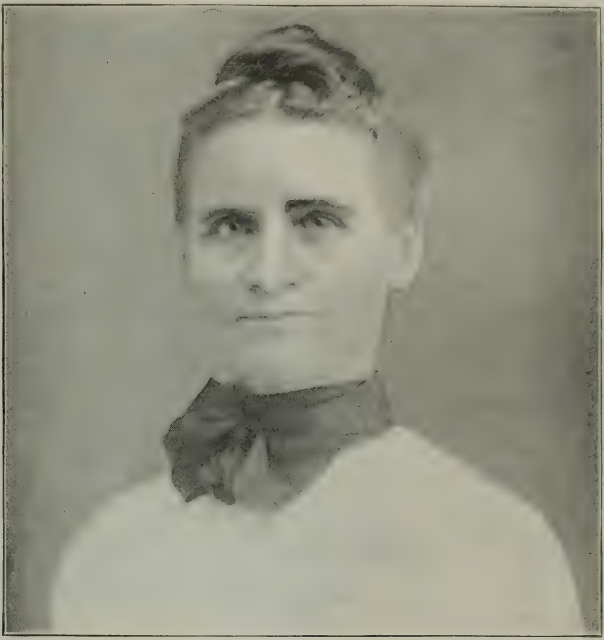
The operation involves severe hemorrhage and represents a great deal of traumatism; therefore it is to be resorted to only in severe cases. Sometimes recurrences start from the anterior inner angle of the antrum, as this part is hidden for probe and eye and cannot be reached by nasal irrigations or astringent applications, due to the most anterior portion of the outer nasal or inner antral wall, which cannot be removed in this method by the antral route.

(2) Denker's operation: In the after-treatment through the nose in Luc-Caldwell's operation it strikes us often, as already mentioned, that we fail to have a good view of the most anterior angle of the sinus, as this part is absolutely hidden by the remaining anterior bony part of the lateral nasal wall, which juts out like a stage side-wing and prevents a perfect view of the antrum and also contact of its anterior inner angle with the injected solutions or astringents for cauterization. Denker's method sacrifices this part of the nasal wall, extending the incision through the gingival mucous membrane from the third molar tooth to one-half a centimeter from the frenulum labia superioris, and then one centimeter upward. In that way the whole apertura pyriformis is laid free; from the lower external edge of the apertura pyriformis, the mucous membrane of the most anterior part of the lateral wall of the lower meatus is elevated, and by means of chisel and biting forceps the whole facial wall is removed to the concave arch of the apertura pyriformis. Now it is an easy thing to remove the most anterior part of the lateral nasal wall. From the elevated mucous membrane Denker forms a rectangular flap, which he turns down upon the floor of the antrum, and which is fixed there by tamponade for three days. A closure of the facial wound takes place at once. No visible sinking in of the facial wall or disfigurement around the ala nasæ takes place, as I can assure.

After-treatment: From the third day syringing with normal salt solution is carried out with ease by the patient himself, and is absolutely painless. Conditions in the antrum can be controlled constantly and easily by direct inspection through the nasal speculum. Cure is accomplished in four weeks in many cases.

Answering the question, What is the condition of the antral cavity after three or six months in a successful case? we have to say: The cavity is partially obliterated by the dense, fibrous granulation tissue which springs up over the bony walls, uniting with those granulations which grow inward from the soft tissues of the cheek or exposed periosteum of the facial wall. This mass of granulation, by the daily application of mild astringents through the nose (25 to 50 per cent. argyrol), becomes gradually covered with epithelium. By examination with a small mirror passed within the nose, or by means of a curved probe, you will find that the original large antral sinus is partially obliterated and is only represented by a small excavation upon the outer side of the nasal fossa.

FIG. 4.



Patient who suffered for fifteen years with empyema affecting the left frontal sinus, ethmoidal cells, sphenoidal sinus, and antrum. The picture shows the results six weeks after radical operation upon all sinuses, as follows: (1) *Frontal sinus*—Killian's radical operation (removal of anterior wall of frontal sinus—frontal bone—down to the supra-orbital ridge, removal of upper part of frontal process of superior maxillary bone, a part of lachrymal bone, and anterior part of orbital plate). (2) *Ethmoidal cells*—Eradication through the anterior hole of orbital plate and frontal sinus. (3) *Antrum of Highmore*—Denker's radical operation. (4) *Sphenoidal sinus*—Opening through the opened antral cavity. Result: Perfect cure after six weeks. No disfigurement of the face in spite of the great traumatism.

Gentlemen, perhaps it has occurred to you that, while enumerating the radical methods for the cure of antral empyema, I did not mention one method which is very much favored by dental or oral surgeons nowadays—the Desault-Küster operation. This consists in the removal of a smaller or greater part of the facial or buccal wall through the gingival labial fold, and in tamponading the cavity for months (five to twelve) in order to obliterate the cavity. This operation fifteen years ago was exclusively the radical operation for antral empyema; but as we have arrived at better methods we have given it up absolutely. For how can we expect to cure a chronic antral empyema by this operation, which leaves intact the upper inner wall of the antrum, the region of the infundibulum, which is so often the seat of extreme pathological changes?—this wall through which, by means of the natural opening of the antrum, the infectious pus from complicating nasal empyema constantly issues into the cavity which we intend to fill out with granulation tissue; an operation which absolutely neglects to draw into the sphere of our surgical intervention the treatment of the other sinuses (frontal, posterior, ethmoidal, and sphenoidal sinus)—a fact which stamps this operation as absolutely insufficient.

Third: By performing this operation we sin against one of the chief principles of surgery, bringing the diseased area which we wish to cure in a lasting free communication with the most infectious cavity of the mouth—a fact which continually reopens new ways of infection and hinders the quick healing process.

Fourth: This operation does not give a free view into the most anterior inner angle of the cavity, from which relapses so often arise.

Fifth: The operation requires a very tedious and complicated after-treatment, five to ten months or longer, which is a great annoyance to the patient, who is forced, as Luc has expressed it, to take his food for many months or a year in a sauce of iodoform and pus.

Sixth: The hole created in the facial wall has a great tendency to close up and become too small, therefore the operator is soon confronted with the fact that he must either insert a hard-rubber obturator to maintain a permanent opening or allow the wound to close. In the one case he forces the patient to wear a foreign body in his mouth for the rest of his life, while if he adopts the other measure he may reasonably expect a recurrence. A careful control is impossible, and recurrences must frequently occur. We cannot, therefore, consider this operation as a radical one.

CONCLUSION.

1. Antral empyemata are due to dental disease only in 29 per cent.; the chief etiological factor (64.6 per cent.) being infection from the nasal passage.

2. In all cases of acute or chronic antral empyema, also with cases of clear dental etiology, it is the duty of the dentist to require the diagnostic help of the rhinologist and to secure the investigation of possible nasal etiological factors or nasal complications. Without determining this the dentist runs the risk of never curing the supposed uncombined antral empyema.

3. In acute antral empyema, with proved dental etiology, the alveolar method is justified as a surgical interference.

4. One is never justified in extracting a healthy, or even a decayed tooth with a living pulp, without co-existing alveolar abscess or pyorrhea alveolaris, for diagnostic purposes only.

5. For all cases without alveolar abscess, etc., the most elegant and painless method in puncturing the antrum is Onodi's method through the middle meatus, which has to be followed by syringing.

6. About 69 per cent. of chronic antral empyema are combined or complicated; that is, the antral cavity has undergone chronic changes by polypous and fibrous degeneration of the periosteal lining, with the formation of cysts; one or more of the nasal sinuses are involved, either by way of the antral abscess or as a preliminary disease, the antral empyema being only the secondary disease.

7. Hence we can scarcely expect a cure in chronic cases by the alveolar method. A cure in chronic antral empyema by means of the alveolar method is only possible in not too chronic, quite uncomplicated cases, without chronic polypous and fibrous changes of the periosteal lining, without necrosis of the floor, without involvement of the nasal sinus and other pathological conditions in the nares.

8. Superior to the alveolar method in chronic cases, with or without dental origin of the empyema, are in all events the intranasal methods. First, Onodi's, for slight chronic cases; Rhéti and Claoué's method for more complicated cases (intranasal removal of the anterior part of the inner wall of the antrum), assuming that there is a wide enough nasal passage for the employment of this method.

9. For very narrow nasal passages (deflected septum) on the affected side, and in complicated cases, especially in involvement of the posterior ethmoidal cells and sphenoidal sinus, necrosis of

the floor and total degeneration of the antral cavity, the radical operation of Luc-Caldwell, and—best of all methods—Denker's operation, are the only ones which give a guarantee for quick and lasting cure. With regard to thoroughness, easy and painless after-treatment, quick and perfect cure, and lack of recurrences, Denker's method is far superior to all others.

10. Küster-Desault's method (removal of the greater part of the facial wall only) is not a radical operation, because it neglects the nasal wall and coexisting nasal sinus suppurations, does not harmonize with modern principles of surgery, and involves a very tedious and annoying after-treatment (five to ten months) without the guarantee of lasting cure.

THE SURGICAL TREATMENT OF CHRONIC ALVEOLAR ABSCESS.

By M. I. SCHAMBERG, D.D.S., M.D., Philadelphia, Pa.

(Read before the thirty-seventh annual meeting of the Pennsylvania State Dental Society, Philadelphia, June 27, 1905.)

ONE of the fundamental principles of surgery is the evacuation of pus wherever it is found within the body. The treatment of an abscess associated with a tooth should be no exception to the rule for the management of similar conditions in other parts of the body. True, it is possible ofttimes to give vent to a pus cavity located at the end of a root through the pulp-canal of the tooth involved. It is likewise possible to create "through-and-through drainage," so to speak, when the canal is patulous and a fistula is present. The passage into the abscessed cavity of carbolic acid or other highly caustic and germicidal preparations tends to destroy the so-called pyogenic membrane, and the abscess is spoken of as having responded to treatment. The canal of the tooth is filled, the fistula heals, and the case is pronounced cured. In a large proportion of apical abscesses the course as outlined prevails, and teeth so treated, as far as the abscesses are concerned, give no further trouble. There remains, however, a smaller proportion of cases, and in the aggregate they reach no inconsiderable number, which, in spite of the treatment applied, either fail to heal or are only temporarily abated and manifest themselves subsequently in more extensive forms or as chronic discharging pus tracts.

To meet the latter class of cases, for the purpose of subduing them, we must enter into a consideration of the possible causes of their continuance after treatment has been applied which ordinarily results favorably. Upon the examination of a large number of extracted teeth we find that a proportion of them have pulp-canals which are either too minute in caliber to adequately permit of drainage, are too tortuous to allow proper cleansing of the apical portion, or which by reason of their combined tortuosity and constriction present insurmountable difficulties when the filling of the canals is undertaken. We likewise notice that the apical portions of teeth which have been the seats of inflammatory action may show one of several conditions: either an exostosis, or an absorption with or without a necrotic change in the tip of the root. When teeth are removed with abscessed or cystic sacs attached to them we are enabled to note in most cases the disproportion between the size of the tumor mass and

Fig. 1.

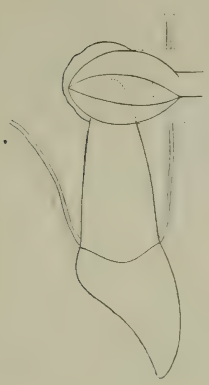


Fig. 2.

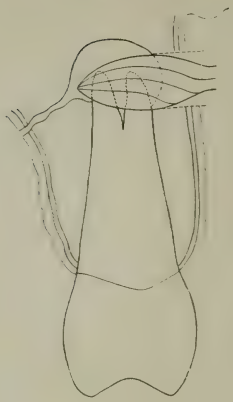


Fig. 3.

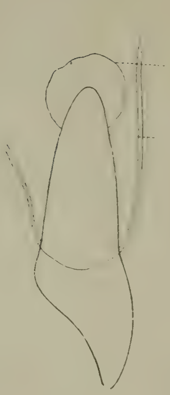


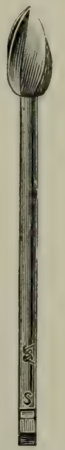
Fig. 1: Diagram of bur No. 1 passing through the gum and alveolus and removing the end of the root of an abscessed anterior tooth.

Fig. 2: Diagram of an upper first bicuspid with an abscess draining through a fistula in the roof of the mouth. The diseased area and the ends of the roots are reached through the buccal plate of the alveolus with bur No. 2.

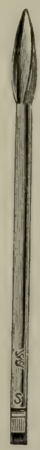
Fig. 3: Diagram of a chronic abscess without a fistula. The amount of root usually bathed in pus is shown, and the dotted lines indicate approximately the size of opening necessary to completely eradicate the disease.

the apical foramen through which the accumulations were supposed to drain. This same relation exists between most fistulas upon the gums and the abscesses of which they are the openings. Again, in the study of jaw bones, large excavations are frequently found showing the extent of tissue destruction about the apices of abscessed teeth. These observations lead the writer to the belief that a free opening surgically produced is essential to the permanent cure of many alveolar abscesses.

The operation that I advocate consists of a rapid ablation of the diseased area including the end of the root by means of a swiftly running surgical bur. (See Figs. 1, 2, and 3.) The mouth having been washed with an antiseptic, the lip or cheek is held out of harm's way by means of a retractor. The point of entrance having been selected with a view to reaching the end of the root, the bur is firmly held to the part so as to prevent its traveling and doing damage to the soft tissue. A sharply defined round opening is thus made through the gum and alveolus, and the end of the root is burred away within a minute's time. The rapidity with which the burs cut (see illustrations—burs No. 1 and No. 2) makes it possible to perform the operation under the influence of nitrous oxid.



No. 1.



No. 2.

Surgical bur No. 1 has but four blades and is designed for rapid cutting of bone

FIG. 4.

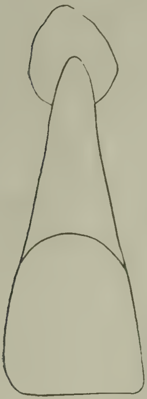


FIG. 5.

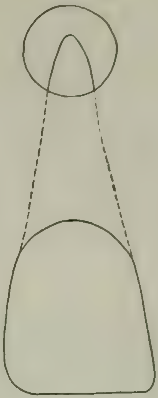


FIG. 6.

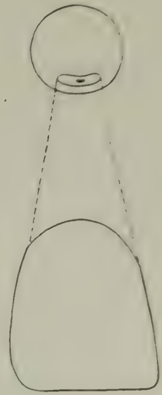


FIG. 7.

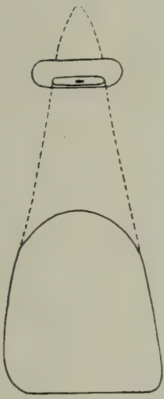


FIG. 8.

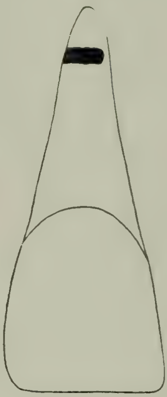


FIG. 9.

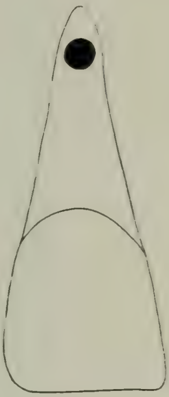


FIG. 4: Diagram of an abscess enveloping the end of a root. That portion which extends into the abscess is bathed in pus, and must be removed if a permanent cure is to be hoped for.

FIG. 5: Diagram showing relation of the size of the opening made by bur No. 1 to the end of the root.

FIG. 6: Diagram of the appearance of the opening and the stump of the root after the use of the large surgical bur for the removal of the infected end.

FIG. 7: Diagram showing the character of the opening made through the alveolus with a fissure bur. When this method of root-amputation is employed the opening is usually too small to permit of the removal of the detached end of the root, and it is frequently lost in the abscessed cavity.

FIG. 8: An incomplete severance of the end of the root which sometimes occurs when the fissure-bur method of root-amputation is undertaken.

FIG. 9: A hole made with a small round bur in the end of the root during an effort at root-amputation. Diagram corresponds to the case shown in Fig. 24.

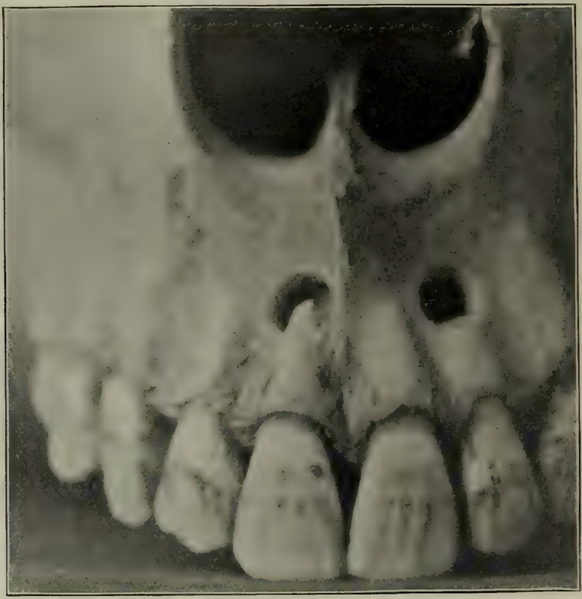
and tooth-structure. When driven rapidly by means of a good dental engine it will pass through the gum tissue and alveolus and will remove the end of the root in less than a minute. It is used mainly upon the large roots of anterior teeth. No. 2 is constructed similarly, but is longer and more slender. It is designed to reach abscesses upon small roots and those of posterior teeth where it is desirable to make a small opening so as to avoid the antrum above and the inferior dental canal below.

If there be any question as to the bur having reached all parts of the abscess, it is well to curette thoroughly. After syringing the cavity thus produced, it is packed tightly with iodoform gauze. The patient is instructed to return the next day, when the wound will be free of all bleeding and a good view of the end of the root be obtained. If at that time there is any further trimming of the root necessary it can be readily done with a smaller bur with little or no pain. If the bleeding should then obstruct the view, a pledget of cotton dipped in adrenalin chlorid and packed in the wound for several minutes will soon clear the field of blood. A topical application of cocain can be made if the peridental tissues prove to be sensitive.

It is always well to be sure that sufficient of the root has been cut away and that the end of the canal is properly sealed before allowing the wound to heal. Figs. 4, 5, 6, 7, 8, and 9 indicate the comparative value of surgically removing the ends of roots by means of a large surgical bur, a fissure bur, and a small rosehead bur.

Teeth in which the canals are open may be filled as soon as all pus discharge has ceased. With a liberal exposure of the end of the stump, the canal can be more readily filled after operation. Both the canal and the filling are less likely to be impregnated with pus organisms several days after the operation, and the filling material can be smoothed off through the wound and the surplus removed. In some cases owing to the canals having been previously but partially filled it may become necessary to seal the ends of the canal with a filling. This can only be done if the canal, as well as the wound opening, is of good size.

Fig. 10.



Opening over the right central incisor was made with a trephine so as to show the end of the root. Opening on the left lateral incisor was made with No. 1 large surgical bur, and shows the manner in which the end of the root is removed and the entire abscess cavity made accessible.

No space should be allowed to remain where germs may lurk. This applies not alone to the canal, but to the edge of the root, which should be cut off flush with the healthy alveolus. If this is strictly adhered to, rounding of the edges of the root becomes unnecessary. The length of time required for the part to thoroughly heal depends largely upon the extent of tissue destruction. Some of my cases have entirely filled with healthy tissue within a month, and a few of the more extensive cases have taken a year or more. During that period, however, the patient is free from the danger of pus absorption, and usually improves in health shortly after the purulent area is eradicated.

Great care must be taken to have the excavation in the bone fill from below with granulations. In packing the wound it occasionally becomes necessary to spread the external opening so as to prevent its closure before the inner portion has filled with healthy tissue. I am still in search of some method of causing the more rapid healing of these cavities. Sponge-grafting in one case appeared to be successful until infection took place through the fluids of the mouth, and necessitated the removal of that portion of the sponge which had not as yet acted as a matrix for the granulation tissue. This experiment so discouraged me that I have not ventured to try paraffin or iodoform injection.

The slowness with which these cavities in the alveolus (see Fig. 10) heal should not, however, influence one against the operation, for it is far better for the patient to have a comparatively healthy wound which may require attention for some time than to permit a so-called "gum-boil" to periodically discharge its contents into the mouth. It is difficult to estimate the extent or character of harm that is done the general system from the ingestion and absorption of pus in the mouth. It, therefore, becomes our duty to cure as promptly as possible all suppurative affections about the mouth. If the usual treatment of a chronic alveolar abscess fails to cure, surgical methods should be employed, and when the condition is found to be such that a cure can be reached in no other way the tooth or teeth at fault should be removed.

The X rays have been of indispensable service to me in arriving at accurate diagnoses. The cause, the extent, and the prognosis of abscesses associated with the teeth can best be ascertained by radiography. In fact, it has become an invariable rule with me to take a radiograph of every chronic abscess before performing the operation, and occasionally I take a second and third radiograph to note the progress of the case.

Radiograph Fig. 11 shows an incipient abscess upon the root of a crowned bicuspid tooth. The history of this case is interesting for the reason that prior to the taking of the X-ray picture there was no definite means of determining which tooth was at fault, for all the teeth in that vicinity were equally tender, and there was no evidence upon the gum of the trouble that was ensuing within the alveolar process. The patient was almost frantic with pain and was willing to resort to almost anything for relief. Opiates had given him but partial and temporary immunity from suffering. Upon examination of the X-ray negative it was noticed that the area of tissue destruction was small and was located at the end of the bicuspid root, the canals of which were well filled. That tooth, as well as the adjoining molar, bore gold crowns. The patient was placed under the influence of nitrous oxid and an opening through the gum and alveolus was made by means of a spear-pointed drill. A small spoon-shaped excavator was used to curette the abscessed area, and the opening was packed with a slender tampon of cotton dipped in camphophénique. Relief from pain was almost immediate, and after changing the dressing for several days the part was allowed to heal. Though several years have elapsed there has been no recurrence of the disturbance about the tooth.

It is intended that this paper should deal more particularly with the treatment of chronic alveolar abscesses, but the report of the case just related is given to contrast the surgical treatment of an acute suppurative process involving the periapical tissues without a fistula with the management of an extensive necrotic disturbance of these tissues such as is encountered in chronic abscesses.

Radiograph Fig. 12 was taken of an abscess of about fifteen years' standing, and one which was given every opportunity to heal through most skilful treatment in the hands of some of the most prominent dental practitioners of the city. A fistula was present much of the time during this long period, and medicinal treatment was directed through the canal, which in the picture is shown to be freely open. At times the fistula would heal, but would invariably re-establish itself and discharge into the mouth. The patient's health became much impaired through the constant ingestion and absorption of the purulent exudate.

The surgical removal of the end of the root was performed as shown in radiograph Fig. 13, and the canal was filled. The picture shows that the point of entrance in this case was a little to the side of the tooth, and that the tip of the root was not completely severed at the first sitting. The end, however, was smoothed off a few days later by means of a fissure bur passed through the opening left by the original operation. This case, according to the latest report, has entirely healed, leaving nothing more than a slight depression in the gum overlying the tooth.

Radiograph Fig. 14 shows an extensive abscess involving the alveolus surrounding the apices of the canine and first bicuspid teeth. This abscess was dis-

Fig. 11.

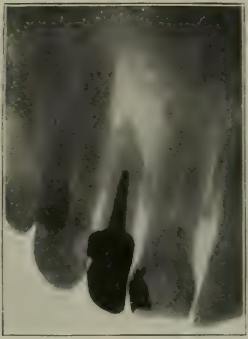


Fig. 12.

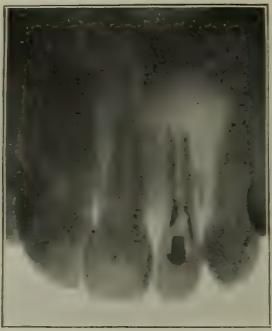


Fig. 13.

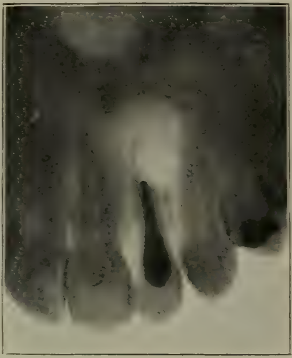


Fig. 14.

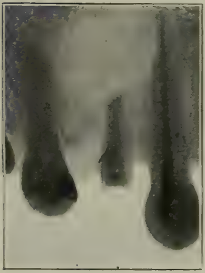


Fig. 15.

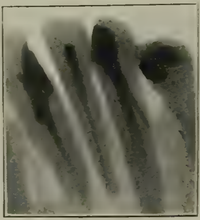
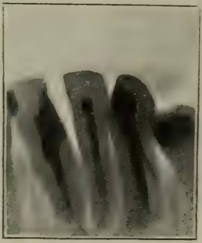


Fig. 16.



charging through a fistula in the roof of the mouth and evidently started upon the bicuspid root. The first radiograph of this case called attention to the fact that the canine contained a dead pulp, whereupon the dentist referring the case was advised to open, cleanse, and fill the canal. The removal of the end of the bicuspid root was performed as is shown in the radiograph and an effort was made to also cut away through the same opening that portion of the canine root which projected into the abscessed cavity. Radiograph Fig. 14, which was taken immediately after this attempt, showed that it was but partially successful.

Fig. 17.

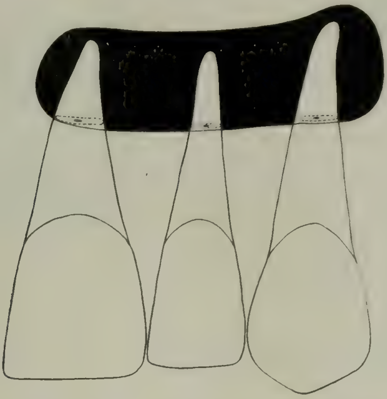


Fig 17: Showing approximately the extent of root-involvement in the abscess illustrated by radiograph Fig. 15. Though it was necessary to remove a considerable portion of the three roots, the teeth became quite firm after the operation.

Fig. 18.

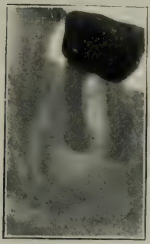


Fig. 19.

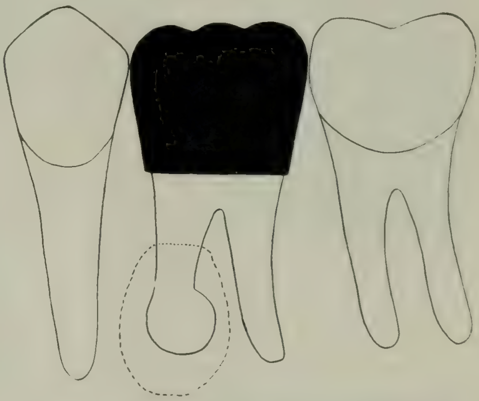


Fig. 19 shows the extent of an abscess upon a hypercementosed root of a crowned lower molar. This drawing is made to illustrate the case shown in Fig. 18. Though there is some tilting forward of the tooth under the stress of mastication, a spur projecting from the gold crown so as to rest upon the bicuspid would overcome this annoyance.

Radiograph Fig. 15 shows three teeth about the roots of which was an extensive abscess. The canals are fairly well filled, even the one artificially produced through the side of the canine tooth. This case was originally operated upon by a surgeon for the cure of

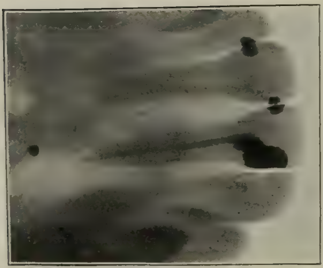


Fig. 20.

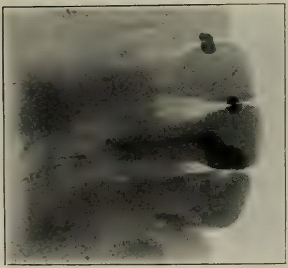


Fig. 21.

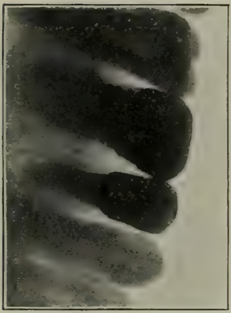


Fig. 22.

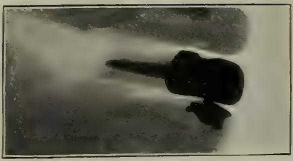


Fig. 23.

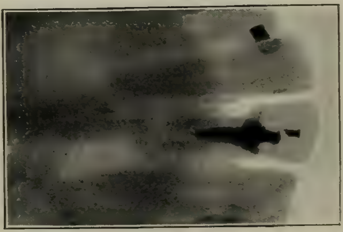


Fig. 24.

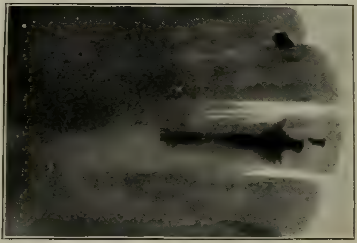


Fig. 25.

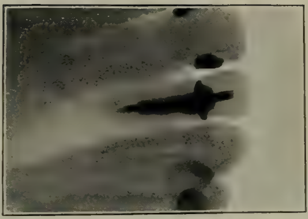


Fig. 26.

the necrotic area above these teeth, but owing to the continuance of the discharge later came to me, whereupon the apical thirds of the three teeth were removed, as shown in radiograph Fig. 16. This proved to be a very extensive abscess, and while it took over a year for the excavated area to fill with granulations, the part is now well, and the teeth have become firm and are doing good service. Fig. 17 gives an approximate idea of the extent of tissue loss.

Radiograph Fig. 18 pictures an abscess upon the anterior root of a crowned lower first molar. The removal of most of that root has been followed by a sagging of the anterior part of the tooth, but a spur if extended from the crown to the bicuspid will overcome that strain. In the absence of a radiograph showing the case after operation, the sketch (Fig. 19) of this case illustrates approximately the amount of root tissue removed.

Radiograph Fig. 20 is a picture of an abscess upon a central tooth with something projecting through the end of the root. Owing to the timidity of the patient, root-amputation with a fissure bur was performed. Radiograph Fig. 21, taken after the root was severed, but before it was removed, more clearly shows the piece of broach which was evidently the exciting cause of the abscess. This case has not been followed by the degree of success that generally accompanies the surgical removal of the end of the root by the method that I usually employ.

Radiograph Fig. 22 shows the area of tissue destruction produced by a chronic abscess upon a lateral incisor bearing a Richmond crown. There being an absence of filling material between the pin and the end of the tooth, the apex of the tooth was removed to the pin, as is shown in radiograph Fig. 23. Whilst the edges of the root appear rough, this case healed promptly owing to the thorough removal of all diseased tissue. The edges need not be smooth if the root is cut off until healthy tooth and healthy alveolus meet.

Radiograph Fig. 24 was taken of a case in which the practitioner referring the case had attempted to cut away the end of the root with the ordinary dental bur. The picture shows that he penetrated the root near the apex, but did not remove the end. Naturally the abscess did not heal. The patient was then sent to me and the tip of the root was removed by means of a large surgical bur. The wound was packed and the patient instructed to return the next day when through the large opening a gutta-percha filling was inserted in the empty portion of the canal. Radiograph Fig. 25 shows that almost as much filling was inserted from the stump end as was originally placed in the canal through the coronal portion.

Radiograph Fig. 26 is of a case which had been operated upon by a practitioner who had not been assisted in his work with a radiograph. The opening he made was not sufficiently large for

FIG. 27.

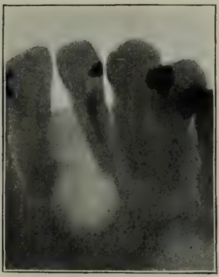


FIG. 28.

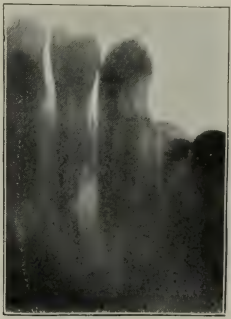
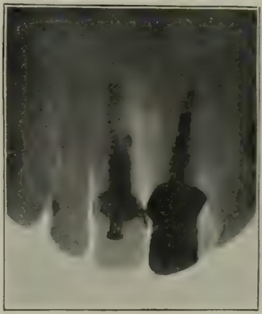


FIG. 29.



him to get a good view of the end of the root; for that reason the unfilled portion of the canal went unnoticed, and the abscess failed to heal. The case was sent to me, a radiograph was taken, the opening was enlarged and the patient returned to the dentist for the remainder of the treatment, which consisted of filling the end of the canal through the surgical opening. This was satisfactorily done by him, and I presume the case is now progressing nicely.

Radiographs Figs. 27 and 28 are of abscesses which can be cured by curetting without apical excision. It will be noticed that neither encircles the end of the root, but they are located in the alveolus between the roots of the approximating teeth.

Radiograph Fig. 29 was taken to determine the nature of an abscess causing the fistula between the central incisors. It is plainly seen in the picture that a perforation through the side of the root had been made, and though it was subsequently filled it is the cause of the abscess.

The operation indicated in this case was the establishment of an opening sufficiently large to view the point of perforation so as to properly seal it.

In concluding this paper I regret that time would not permit my entering into the relative values of the various methods of surgically treating alveolar abscesses, nor have I given a description of the lip retractor which I have designed for this work. In the discussion of the paper many of these points will doubtless be touched upon, and I trust that they will in a measure compensate for the many omissions in this hastily prepared and incomplete article.

IS THERE AN IDEAL OCCLUSION OF THE TEETH IN THE HUMAN JAWS?

By **HERBERT LOCKE WHEELER, D.D.S.**, New York, N. Y.

(Read before the First District Dental Society of the State of New York, October 10, 1905.)

MUCH of the interest of our profession is at present being expended upon the question of orthodontia, that is, the science of the correction of malocclusion or irregularities of the teeth. That being the case, I found while examining some 1500 skulls, many of them prehistoric, at the American Museum of Natural History in New York city, and at Peabody Museum, Harvard University, for the purpose of observing the condition of the alveolar walls, that my attention was attracted in many cases to the occlusion or articulation of the teeth.

We have been taught by the modern prophets of orthodontia that under no circumstances should extraction be resorted to, and that there is in the normal mouth a perfect and ideal adaptation not only of the teeth but also of every cusp and sulcus, and that to fail to secure this condition in each and every case leaves the patient so crippled in masticatory power that anyone who is so perverse and unskilful as to fail to secure this foreordained perfection of articulation is guilty of introducing a direct menace to the health and well-being of the patient. One enthusiastic apostle of this idea has been heard to assert that in the wearing down of teeth through mastication, if they were in their exact and proper relationship the various grooves and cusps on the grinding surfaces would be preserved. I mention this to show how far some of the men deeply interested in this subject have gone in order to justify their belief in an ideal from which every variation is accounted a species of degeneration—to be promptly returned to the normal standard by their highly skilled selves.

Do not imagine because I speak thus that it is the design of this paper to deny the assumptions of these teachers or to take issue with them. Such is not my intention. I am a student seeking for knowledge; and, as I meet constantly so many variations from the typical cases that we have so nicely cataloged and arbitrarily divided in two types I am anxious to know by what authority patients can be classified thus and so; by what particular appliance, labelled for this or that type, purchased by number and applied by rule, can we have the ideal occlusion that the Almighty originally worked out for man.

In my observation upon the skulls in the collections mentioned, I shall report none but those in which all the teeth were in place in the alveoli—or all posterior to the canines.

These skulls which came under my examination comprise those of the numerous tribes of ancient Mexico secured by the Hyde expedition; of the Peruvians, brought here by Professor Bandolier; skulls from British Columbia and from Michigan; skulls from the mounds of Kentucky collected by Professor Smith; skulls from Siberia (Eskimo) southern California, Tennessee, Tierra del Fuego, and Patagonia. Professor Thompson of Topeka has stated that there is a distinct type of tooth in the various tribes, but I have been unable to observe this, and the anthropologists whom I know do not admit this contention. There is, however, one condition that seems to prevail in all savage tribes, ancient and modern, *i. e.* the bite, instead of being according to the beautiful plaster casts so many of us have seen, with the incisors and canines of the maxilla overlapping those in the mandible, strike edge to edge and are worn down equally with the molars and bicuspids. This is a universal condition so far as I have been permitted to observe; in cases in which there is no sign of caries and the teeth are firmly imbedded in the jaw, and in their proper positions, the wear is on an almost perfect plane. First, the palatal cusps on the upper teeth and the labial or buccal cusps on the lower are worn down. Gradually both outer and inner cusps are worn smooth and perfectly level. Then the dentin, becoming uncovered under the cusps, wears under the process of grinding more rapidly than the surface of the tooth yet covered by the enamel, and wherever the enamel is entirely lost a slight cupping of the dentin occurs. This cupping does not occur in the same place in the various teeth in the same mouth, and the third molar, because of the lateness of its eruption, appears to retain longer the covering of enamel on the grinding surface.

Now, with the system of inclined planes entirely obliterated and some parts of the surfaces of the grinding teeth changed by cupping so as not to occlude at all, do you think that the welfare of the savage with a complete denture is seriously interfered with? Do you suppose—if the savage be able to satisfactorily meet the demands of his environment, which has in the past been one in which his means of subsistence has been largely the meat of game in the case of those living in the interior, and of fish on the coasts—that this perfect occlusion heralded by modern orthodontists is of such importance as they suppose in our own environment, in which the meat is softened in cold storage and the cereals are ground and their cellular structures destroyed by various mechanical means, while in addition to this both are cooked, thus completing by chemical means the reduction of the structure if it be not already disintegrated?

It seems to me from observing the evolution of the teeth of the horse or of an animal of the same species supposed to have been the ancestor of the horse, the remains of which are supposed to be of an age close on to two and a half or three million years—that teeth both as to their structure and their position, or relationship to each other, have not been a matter of design for a particular purpose, but that rather, in their evolution from the primitive cone shape to the more complex forms, they have developed in response to the demands of the environment. This is evidenced by this horse-like animal referred to, the earliest specimens of which are seen to have teeth with a construction not unlike the human teeth of today, with the major portion of dentin covered with enamel. Now, in the process of time physical changes affecting the surface of the land took place, and this ancient kin of the horse, from living in the forests and possibly subsisting on a mixed diet, became of necessity a roamer of the plains and was thus confined to a grass diet. The effect is shown in the gradual change in the shape of the teeth, the enamel dipping down deep in the dentin and the whole becoming gradually covered with an extra outside layer of cement, and when the effects of wear come upon the grinding surface of the molars we find ridges of the enamel standing up higher than the dentin, because of its standing the wear of attrition better, and running laterally across the teeth, forming an uneven surface. I believe the conclusion is that the earlier horse had not as long a life as his present descendant.

If the process of development of the teeth in this and other animals be shown to have been in response to the demands made upon them in the performance of their duty in contributing their share toward the necessities of existence, what evidence is there that the teeth of mankind are not subject to the same laws? To be sure there seems to be evidence of the existence of vertebrate mammals back several million years, while with man there is not much evidence of existence back of fifty thousand years; but this does not prove that the species did not exist prior to that, for the very conditions that have preserved these ancient bones of the various North American animals are the ones that man, had he but slight reasoning powers, would have avoided, and as the evidence of man which extends so far back is not entirely one of bones, but of crude and primitive instruments, this would show a degree of intelligence at that early stage of his existence, and possibly, because of the prehensile power of his hands, he may have been able to aid his teeth to a slight extent in those early times by some small amount of preparation of his food before masticating it. At any rate the quality of the work demanded to properly prepare the food for the stomach has changed greatly, owing to our rapidly advancing material civilization, and the demand upon the teeth at the present time is vastly less than it was one hundred years ago, or one thousand or twenty thousand years ago by primitive man.

If this is so, may there not be something in the idea that most cases of irregularity of the teeth are a form or symptom of physical degeneration, made easier in modern times by the better protection of the weaker individuals, so that greater numbers are now carried through infancy and grow to adult life and procreate their kind than did in the past? And may not the situation be aggravated by the tendency of our age to eat little but what is soft and tender—so that, the harsh conditions under which the various tissues of the oral cavity have developed not obtaining, there is a tendency not to supply the parts with the necessary nourishment to make the strong and heavy structure originally demanded, and as a result there is a tendency to fall off and atrophy in the more vascular parts, while the teeth, being of a different structure, change less rapidly and adjust themselves to new environments more slowly?

If this be the case, with the bringing together of individuals whose ancestors have existed long under totally different environment, may it not sometimes be that the offspring of such a union may favor the facial bones of one parent and the teeth of another, so that the comeliness of the expression is affected in such a way that the extraction of one or more teeth might not only be permissible but imperatively demanded, in order to change the unsightly and unattractive into the beautiful? It is so apparent that nature either makes mistakes, or is so far short of supplying what is demanded to meet the best interests of a given individual, that it seems to me that a man of experience and judgment can often assist in bringing about a desired result by either subtracting from or adding to the efforts of nature; and I am not yet convinced that there may not be cases in which the extraction of teeth for regulating purposes may not be entirely justifiable, indeed a necessity.

THE PERFECT RETENTION FOR GOLD INLAYS.

By Dr. ARTHUR HYNES FLEMING, Spartanburg, S. C.

ONE of the most discouraging things that can happen to the dentist is the return of dissatisfied patients. This will always exist as long as dentistry is a science, and in order that we may reduce the number of those who so return, we must reduce the amount of temporary work and do everything as nearly permanent at first as the present state of dental science will permit.

There is no doubt in my mind that gutta-percha, cement, and alloy fillings have saved many teeth; neither is there any doubt that these materials, and the ignorance of the durability of them on the part of the patient, have resulted in the loss of many teeth that could have been saved had a permanent filling been used at first.

It is often the case that a patient will come in and say that someone filled a tooth not quite a year ago for him and the filling came out, and he does not think it will be of any use to insert another. Upon examination the case reveals a washed-out cement filling, a squeezed-out gutta-percha filling, or a decayed-out alloy filling. I should not care to be responsible for the statement that a gold or porcelain inlay can be put in any place where any of the three previously named materials are used, but I do know that there are many cases where these materials are used when an inlay could have been employed and the tooth preserved from further decay, thus retaining a permanent filling.

The inlay system of filling cavities is the most artistic and durable method known to dental science. Anyone will tell you that a gold inlay in any of the posterior teeth is better than any other filling, provided that the inlay can be made to stay.

It is my purpose to describe a system of retention for gold inlays whereby the range of the inlay will be almost unlimited. This system is so easy in all of its steps that it is only a short time until this or some similar one will cause the dentist to say that he can insert gold anywhere that he can place cement.

The prevailing methods of anchorage for gold inlays have been by the use of small platinum pins which are soldered to and project through the floor of the matrix, and are received by small holes which have been drilled into the tooth in such a position as to avoid contact with the pulp-chamber if the tooth be vital, or by larger pins which extend into the pulp-chamber or root-canals if the tooth be devitalized. It is often difficult to get these pins in such a position that the matrix will draw easily, especially if there be poor access to the cavity or if there are other teeth standing in the way. The hollow retention can be used in all cases of gold inlays and in many cases where the pins cannot be used.

I shall not describe cavity preparation for a matrix, as it is understood that the operator is thoroughly familiar with this. The first step is to get a good matrix in pure gold 3-1000 of an inch in thickness. The matrix is put into position and filled with semi-hard modeling composition, which is packed into the matrix with a flat instrument and allowed to cool or become hard, and then removed and invested in a good investment material. After the investment has set it is warmed, and the modeling composition is removed. (Fig. 1.)

FIG. 1.

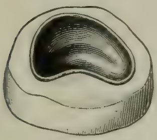


FIG. 2.

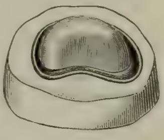


FIG. 3.

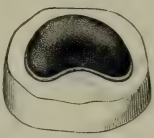


FIG. 4.

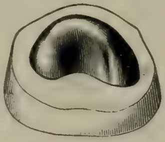


FIG. 1: Showing matrix and investment ready for the soapstone core.
FIG. 2: Showing core in position.
FIG. 3: Showing core after having been covered with moss fiber gold, now ready to be soldered.
FIG. 4: Showing inlay after it has been soldered.

We now have a fair idea of what the contour is to be, so the next step is to build a core for the inside of the inlay which can be removed from the back when the inlay is completed. This core is made of fine soapstone with one-tenth plaster of Paris, and is worked to a stiff consistence with alcohol, placed in the center of the matrix, and trimmed so that it nearly fills the desired contour. (Fig. 2.)

FIG. 5.

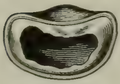


FIG. 6

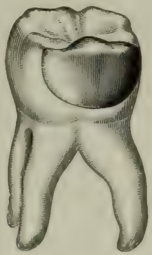


FIG. 7.

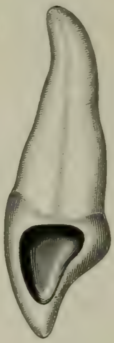


FIG. 8.

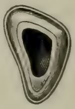


FIG. 9.

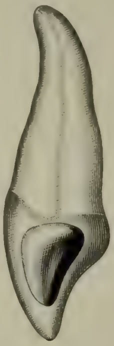


FIG. 5: Showing back of inlay with core removed, leaving the hollow retention.
FIG. 6: Showing inlay after it has been trimmed down, polished, and set.
FIG. 7: Showing cavity in canine tooth.
FIG. 8: Showing hollow inlay for cavity shown in Fig. 7.
FIG. 9: Showing hollow inlay after having been cemented into cavity.

This core is then covered with moss fiber gold and the proper contour is built out in this plastic material. (Fig. 3). This is then covered with a little cream borax and the solder is placed on this. After this has been done, the whole is placed on a wire gauze, the flame is applied from beneath, and the investment is heated very slowly. When the investment and core have been dried out thoroughly, more heat may be applied from beneath, and this is increased until the solder has been melted, at which time more should be added until the moss fiber gold has taken up all that it will; this it does as a sponge takes up water. When the moss fiber gold becomes saturated you will notice the surface begins to have a solid or glazed appearance. At this point the flame should be removed from beneath and a slow-light flame wiped over the surface of the inlay, which will smooth the surface just as glazing smoothes the surface of a porcelain inlay. (Fig. 4.)

The inlay is now finished, and all that is required to make it ready for the tooth is to grind it down to its margins and polish, then remove the core.

The investment is removed, when the margins of the inlay can be easily seen, and the overlapping gold is cut or ground away and the edges smoothed with a fine disk. The inlay is polished and the core removed from the back, which leaves a hollow inlay and a hole that is larger at its base than at its opening, giving additional strength when the inlay is set. (Fig. 5.)

The cavity should be undercut and thoroughly dried. The inlay is dried and filled with cement, the cavity is also filled with cement, and the inlay is forced into position and held firmly until the cement has set. You now have the best and strongest filling that can be made. (Fig. 6.)

There are many modifications of this system, which I think needless to describe, as they will come to any good operator who has an inlay practice, and the hollow system is so simple that an operator with no experience can begin the work successfully.

I deem it useless to point out the advantages of the inlay principle, as that has long been settled in the mind of the conservative operator. The advantages of the hollow retention are that the inlay can be put into closer spaces and into more cavities, it is more easily made, and requires the use of less gold than any system now in use.

We also know that there is seldom or never any recurrent decay around an inlay and never any flaking, breaking, or chipping of a filling so constructed. The time required to insert an inlay is much less than that required to put in a gold filling, and the range of the inlay is almost as broad as the range of cement. The time that the patient is in the chair is not one-third the time required to put in a gold filling, and the great strain on both the patient and the operator is reduced to a minimum.

MAXILLARY FRACTURES.

By HAROLD DE WITT CROSS, D.M.D., Boston, Mass.

(Read before the Massachusetts Dental Society, at its annual meeting, Boston, June 8, 1905.)

THE number of appliances and methods which have at various times been suggested for the treatment of maxillary fractures are numerous, and while each has some distinctive feature the underlying principles of all are similar.

Bandages have been used for a great many years and are first mentioned in the works of Sorana, who lived in the second century, but were probably in use hundreds of years before, as a bandage of some nature is always at hand and is the first relief of which one naturally thinks to support a broken bone. The oldest method of retaining the fragments in apposition is by means of ligatures. The earliest mention is made by Hippocrates in the fifth century B.C. The ligatures were of silk or wire and were first applied around the teeth adjoining the fracture.

Dr. Buck of New York in 1847 was the first to employ the method of drilling holes in the bone—which operation was later performed by Hamilton and others. In 1863 a Mr. Thomas, a surgeon of Liverpool, improved the method of tightening the ligatures by employing a forked instrument, by means of which a coil was tightly wound at each end of the wire. Soon after this, Mr. Wheelhouse of Leeds varied this operation by using flat-headed pins driven into the holes in the bone around which the wire ligatures were passed. The next form which the ligature assumed was that of a wire splint, which is known as the Hammond splint, and was extensively employed during the Franco-German war.

The earliest mention of an interdental splint was by Chopart, whose splint consisted of an iron trough lined with some soft substance—and with clamps extending on either side from an iron chinpiece to the splint.

Sudduth's splint aims to be one of a universal nature and consists of a chinpiece which is of metal made to hold plaster of Paris; the metal tray which covers the teeth is adapted to take a lining of modeling composition, and the chinpiece and splint are held together by means of ratchet clamps. While this answers the purpose of an adjustable appliance it is very cumbersome and complicated. Hayward of London in 1858 was the first to employ an *accurately fitted* splint covering the teeth and gums. This splint was made of metal swaged to fit and with rigid wire arms soldered to it. These arms were for the adjustment of a bandage beneath the chin. Ten years later, after the process of vulcanizing rubber was discovered, Dr. Bullock of Savannah made a splint similar in every detail to Hayward's excepting that vulcanite was employed in place of the swaged cap. And the Kingsley splint, as we know it today, is a modification of the Bullock splint, and is usually made with detachable arms.

In 1861 Dr. Gunning of New York made the first vulcanite *interdental* splint. This covered the teeth of both jaws and was provided with an opening between the anterior teeth, left for the purpose of feeding. The vulcanite splint devised by Dr. Bean of Atlanta and employed by him during the war of 1861, is very similar to the Gunning splint, except for a modification in the form of bandage and chinpiece. A further modification of the interdental splint, in regard to attachment, was made by Harrison Allen, who employed screws passing through the sides of the splint and impinging in the V-shaped spaces between the teeth.

From the foregoing brief history of the development of appliances for the treatment of maxillary fractures, it is easily seen that dentists have had considerable to do with their development; and while the treatment of fractures naturally has fallen to the general surgeon, it is the dentist, who, familiar with the mechanical details of making appliances for the mouth, is best able to treat maxillary fractures if also he understands the general treatment of fractures and has become especially familiar with those of the maxillæ.

This fact is today recognized more generally than ever before by the general surgeon, who rarely attempts to treat a fractured jaw without the assistance of a dentist. The surgeon must rely on one of three methods: either he must make an incision, drill holes and wire the fragments, trust to a very crude wiring of the teeth, or use simply a bandage. Out of a large number of cases which I have seen, when wiring the bone had been resorted to, the almost invariable result has been that in order to hold the parts firm it was necessary to twist the wire so tightly that fragments were broken away from the bone, resulting in the formation of an abscess. Wiring about the teeth is usually done in a very crude manner and with poorly adapted material. The method of bandaging alone, if properly done, so as to hold the parts firmly in place, is suitable for about two per cent. of cases. In neither of these ways, excepting the small percentage refered to where the occlusion is locked, can a good occlusion be ultimately secured. For fractures of the coronoid process and for a very small per cent. of fractures occurring in the mandible of young children, wiring is about the only recourse.

The interdental splint—either vulcanite or metal—is the most universally applicable splint, for with slight modifications it may be successfully applied to fractures of either the maxilla or the mandible, and to those involving any portion of the mandible from the symphysis to the neck of the condyle. In the construction of this splint the "bite" should be opened but a *very* little—never over one-eighth of an inch—as the slight opening gives more comfort to the patient in talking, swallowing, and taking nourishment, and the fragments will be in better apposition, especially if the fracture is posterior to the third molar. It is not essential—in fact it is a decided disadvantage—to make the space wide enough to admit of the introduction of a feeding tube—as the lips are then so widely separated as to prevent their closing about the tube for suction, while with a narrow opening one can easily take a tube between the lips or drink from a cup.

In connection with a splint of this construction it is usually necessary to employ a bandage. For this purpose a 6-yard by 2-inch gauze roller applied in the form of a Barton bandage will usually answer the requirements best. The four-tailed bandage is of very little use at first because of the small amount of force which can be exerted by it. The Barton should be applied tightly enough to retain the fragments in position. If more force is needed, after the lapse of a week a strap bandage may be substituted to advantage. The fact that this form of bandage prevents the performance of the function of the mandible in masticating and talking I consider a decided advantage, as it permits of a more rigid approximation of the fragments, with no opportunity of motion, which is impossible with any form of appliance which permits a free motion to the mandible, and which is very harmful to all but the simplest fractures. An arm that is broken is not allowed to swing in its splint at the side, neither are the fingers used in their usual functions.

Other very useful appliances are those devised by Dr. Angle, and the swaged metal caps or splints.

In constructing any form of splint where the bite is to be opened, the face bow can be used with a decided advantage, as by its use the relations of the models to the condyles of the articulator are accurately obtained, so that when the bite is opened there is no disturbance to the relations existing between the two jaws. In other words, the models on the articulator move in an arc of the same radius as does the mandible itself.

In constructing any form of splint it is *absolutely necessary* that each step of the work be done with perfect accuracy, in order to insure the desired results. Kind of appliance selected has far less to do with the success of any individual case than does the manner in which it is adjusted.

Both of the maxillary bones are frequently subject to fractures. The mandible in particular, from its exposed position, its shape, and its lack of support to stand a severe blow.

Fractures of the maxilla are not of very common occurrence and rarely happen from violence when the inferior is not also involved. Fractures of this bone are much more easily treated than are those of the inferior, as a rule presenting very few difficulties; while most of the fractures of the inferior maxilla are often more difficult to manage than those of any other bone the surgeon is called upon to treat.

The cause of fractures of the maxillary bones is violence of some nature. Cases of fracture of the maxillary bones resulting from the extraction of teeth have been reported, but are exceedingly rare, as such fractures are nearly always confined to the alveolar process and are so common as not to be considered at all serious unless quite extensive; nevertheless sometimes requiring an appliance of a simple nature.

Among the more common causes may be mentioned kicks from animals and men, falls, blows from fists, clubs or missiles, crushing under wheels or between large bodies, while gunshot wounds are not infrequent.

The diagnosis of these fractures is usually easy, as the symptoms attending them are rarely obscure. There may at times be difficulty in locating all of the fractures when there are several, or when there is considerable swelling and little mobility.

Diagnosis of fractures of the coronoid or condyloid process, or of the ramus is more difficult than when the body of the bone is the seat of the fracture; but such fractures may usually be determined by passing the index finger of one hand into the mouth and feeling in the suspected locality in conjunction with a finger on the outside.

In order to locate a fracture of the body of the bone, grasp it with the forefingers introduced into the mouth and resting on the teeth on each side of the suspected point, and there will be no difficulty in recognizing a slight motion of the fragments.

The general symptoms of a fractured jaw are uneasiness, soreness, inability to masticate, inflammation, interference with speaking and swallowing, salivation, and drooling. There is usually an unnatural mobility and crepitation, with displacement of the fragments, which is seen by the irregular line of the teeth; more or less pain at the seat of the fracture; contusion and laceration of the integument, but rarely a severe hemorrhage.

The shape of the fracture whether square, diagonal, or V-shaped—its distance away from the median line; the force and character of the blow received, together with the action of the various muscles, serve to determine the nature and amount of the displacement. If the fracture be multiple, irregularities are produced in the contour of the arch, and in the occlusion of the teeth. Garretson says, "If the freed portion be the anterior or chin part, it will be dragged downward and backward by the action of the genio-hyoid, genio-hyoglossus, and digastric muscles. If it be at the line of the canine tooth and at the upper portion of the ramus, the fragment will be displaced inward by the action of the masseter and forward by the external pterygoid."

If the fracture be single and beneath the attachment of the masseter, crepitation will be present but little displacement.

If the neck of the bone is broken, the body is dragged forward by the action of the external pterygoid, and much pain will attend the movements of the jaw. While, theoretically, this is true, you will meet with many fractures which for one reason or other do not follow this rule.

The act of swallowing or of moving the head or tongue will serve to move the fragments and change the displacement.

When the fracture is in the coronoid or condyloid process there may be associated a dislocation of the condyle.

In the mandible the displacement may be very persistent either on account of the action of the muscles or from the shape of the broken ends—so much so that occasionally it is impossible to bring the bone into its normal position. With the maxilla it is different, for even with a considerable displacement there is little difficulty in restoring the fragments to place or in retaining them after they are put in place.

The location of fractures of the mandible is frequently at the line of the canine and the mental foramen, or at the symphysis, as in a jaw with all the teeth present these are weak places. The jaws of children are more liable to be fractured at the symphysis than are those of adults.

When teeth are lost and the process absorbed a weak place is made in the jaw and, other things being equal, a fracture is invited at such a locality.

But age, the direction and force of the blow received, together with the resisting strength of the various parts of any individual bone, serve in a great measure to determine the location of a fracture.

In gunshot injuries or accidents resulting from the application of great force, the fracture occurs at the point where the force is applied.

Fractures of the maxilla follow no set rule as to their location. They are frequently in a crushed condition due to the cellular structure, and are very likely to be comminuted. Often the alveolus is broken away from the bone, which is perhaps the more common form.

As said before, the maxilla is rarely fractured unless the mandible is also involved. Kingsley reports a case where a bell-rope caught around the maxilla and crushed and tore the bones apart with no injury to the mandible.

Garretson says that fractures of the maxillary bones are to be divided into simple and complicated. The first relates to such cases as are without external or associated injury, implying a single break in the continuity of the bone. The second embraces all conditions associated with comminution of the bones, with external lesions, injuries to vessels or teeth—in short, to any relation which alters the fractures from one of a simple to one of a compound character.

Surgically, nearly all fractures of the body of the bone are compound, the opening existing usually on the lingual aspect, due to the easy lacerability of the gum tissue combined with the quick inward displacement of the fragment.

Complications frequently arise in the treatment of fractures and are of many descriptions. The more common is the formation of an abscess which may be the result of comminution of the bone at the time the fracture occurred, the infection from a putrescent pulp, too tight bandaging, or a poorly fitting splint. Severe hemorrhages are reported by some writers, but are of rare occurrence, except of a secondary character from sloughing of the tissue.

Teeth may be broken or loosened, the soft tissues may be cut or lacerated, there may be acute pain or severe inflammation and swelling of the parts. One would expect considerable disturbance and serious injury to the inferior dental nerve and vessels when this part is involved, but anything of a serious nature rarely occurs. Frequently we meet with cases of temporary or permanent paralysis, partial anesthesia of the part supplied, convulsive muscular movements, spasms and neuralgia. Necrosis is not an uncommon sequence and may lead to further complications unless promptly checked. It may be the result of unusual difficulties in the case, of neglect, or of the refusal of the patient to submit to the necessary restraint. From comminution and other causes it sometimes happens that fractures of the maxillæ—like those of other bones—fail to unite, and a false joint is established, or after necrosis the bone may form a fibrous or irregular union which may be quite considerable in extent.

The prognosis of fractures of the maxillary bones is usually favorable, as there is little danger to life except in cases where the force of the blow has been sufficient to produce compression or concussion of the brain, and in gunshot wounds where great comminution and subsequent necrosis has exhausted the economy.

Fractures of the neck of the condyle are particularly serious from their liability to produce brain complications.

There is usually little deformity following fractures of the maxillary bones if they are skilfully treated, although frequently great difficulty is experienced in keeping the parts in place. When poorly fitting splints are used and the parts are not held in place it is usually necessary to grind or extract one or more teeth, in order to allow them to strike squarely together.

Ordinarily fractures of the jaws unite quite readily; yet the time necessary to establish a bony union varies with the circumstances of the case, the upper jaw requiring generally less time than the lower.

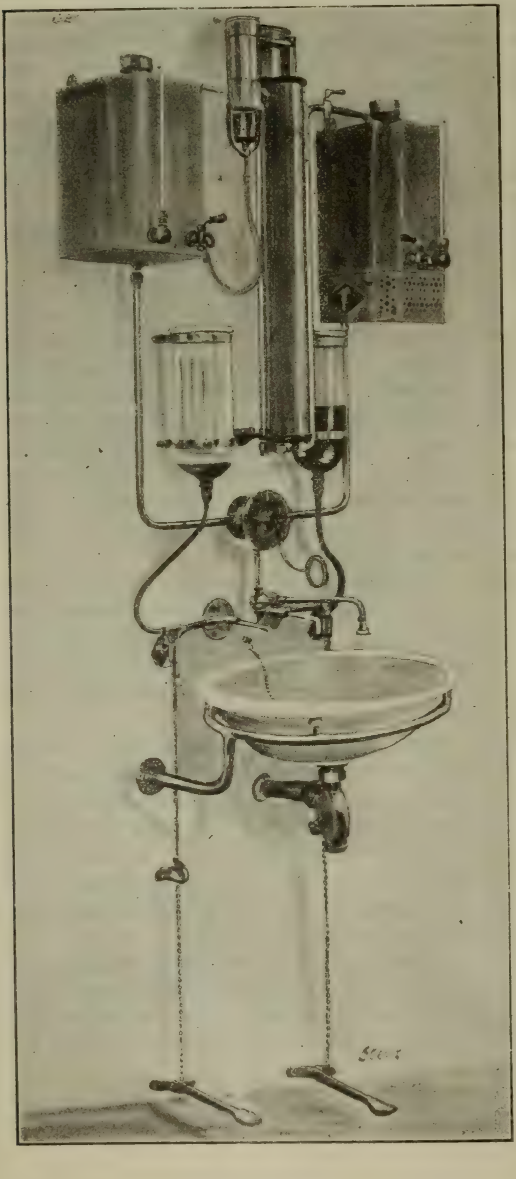
With no adverse circumstances thirty days for the lower and twenty days for the upper is sufficient to make a positive union, but where complications arise a much longer time may be required. The age and vitality of the patient have considerable effect on the time required for the fragments to unite.

There are cases reported which have united after a period of three years, but after the lapse of a few months the chances of a firm union are very slight.

AN ANTISEPTIC WASHSTAND.

By HENRY L. WEBER, D.D.S., Paris, France.

THE apparatus itself is very plain. It is composed of a Lepage sterilizer in the center; on the left side about six feet from the ground there is a receptacle for cold water, and on the right side at the same height another one for warm water. Each receptacle is of about ten liters capacity. By means of a very simple device the two receptacles are connected to a joint which can be moved by the elbow, thus allowing for the escape of either cold or warm water, or both in different proportions, as one may desire. Below the receptacles there are two smaller glass containers connected by means of chains to foot pedals. One of the receptacles is for the antiseptic liquid soap, and the other for the antiseptic solution.



The Lepage apparatus for sterilizing water is a very simple one. It is composed of an arrangement to control the pressure of the water, which entering a small boiler is heated above 200° F. The sterilized water passes into a cylinder which is divided into two compartments, one for the cold water and the other for the sterilized water; the latter coming in contact with the cylinder of cold water is cooled sufficiently to permit of its being used at once.

By means of the Lepage apparatus all possible forms of bacteria which may be present in the water are destroyed, and it is therefore superior to all other methods of sterilization with the sole exception of the distillation process.

As seen in the illustration, there is a little tube attached to the joint that is worked with the elbow. This tube closes or opens the water outlet when moved to the right or the left respectively. On each side of the tube there are two smaller glass tubes connected with the glass containers. Through these smaller tubes the supply of the antiseptic soap and the antiseptic solution is controlled. In sterilizing the hands they are rubbed with the antiseptic liquid soap and rinsed in the sterilized water. The advantage of this apparatus is due to the fact that it is altogether manipulated with the elbow and foot, the hands never coming in contact with any part of the device.

I am indebted to Dr. Wormser for the formula of the antiseptic liquid soap which I use, and which is as follows: White soap 1 kilogram, glycerin 250 grams, salol 60 grams, olive oil 250 grams, black soap 200 grams, water 3 liters. Boil for three hours and cool for one day, then add water 3 liters, decant, cool, and then add alcohol of 90° 250 grams. Put aside for two or three days and filter. These proportions are for five liters of liquid soap. I have found the plan which I now recommend very economical, as only a few drops of the liquid soap and antiseptic solution are required to thoroughly cleanse and sterilize the hands.

READILY-MADE MATRICES AND THEIR APPLICATION.

By H. W. ARTHUR, D.D.S., Pittsburg, Pa.

(Read before the Pennsylvania State Dental Society at its annual meeting, Philadelphia, June 27, 1905.)

BY a readily-made matrix we mean one that can be made for each case in hand, if need be, and especially for those cases where the ordinary appliances do not meet the requirements. The time employed in making a matrix will be more than compensated for by the time saved in filling.

In advocating the readily-made matrix we would not underestimate other appliances of this kind at hand.

The use of a matrix is to reduce a cavity having two or more orifices to one, and to furnish a mold for forming the filling material. The nearer we can approach exactness in introducing the filling material, especially at those points made obscure when the introduction of the filling is completed, the more sure are we of good results. For convenience in describing the forms of this appliance they may be classed under the following heads: the strip, the band, which includes the loop, and the single and the double slip matrix.

The *strip* is applicable to the anterior teeth. It is applied from a fixed point by slipping it between the teeth from labial to lingual, covering several teeth, and is brought close to the margins of the cavity by the use of a burnisher. To give rigidity where it is needed, after the first adaptation the strip may be removed and hard solder flowed on the back of it. This can be done and the strip replaced, as shown on the model [exhibiting] where the lingual wall of a lower lateral is supplied. The case exemplified could not be approached from the lingual side. With the strip matrix the lingual or labial wall may be supplied, and a mesial or distal wall also if need be.

The *band* matrix is a strip passing around a tooth, drawn close with pliers and soldered, as suggested by Dr. Herbst. It is especially valuable for plastic fillings. If properly fitted, where exact contour and approximal contact is desirable, it may be left in place until a subsequent sitting.

Where there is a cavity on the distal surface of a bicuspid or molar and an open space between the teeth, the band is especially applicable when the filling material is gold. Passing as it does around the tooth, it gives all the resistance needed, except at the cervical margin, and there it may be supplemented by the use of impression compound braced against a distant tooth. The compound while it is soft can be shaped with the burnisher to the contour of the tooth inside the band and cavity. The result, as shown on the model [exhibiting] is more practical than it may seem to be. The ordinary German silver finishing strip will meet the requirements in most cases. The fact that hard solder can be used makes the German silver specially valuable for this class of matrices.

The *slip* matrix, if we take into consideration the class of cavities to which it is applied—approximal cavities on the bicuspid and molars—stands first in the order of importance.

The *readily-made slip* matrix is made of sheet steel, No. 33 gage preferable; this thickness has sufficient rigidity and will spring into place around the embrasure when properly shaped. With the addition of curved plate shears, contouring pliers, plate punch, and a half-round file or a carborundum wheel, a matrix of this class can be formed in a few minutes, to suit any case.

Take a piece of sheet steel of the required length and width, shape it to avoid impinging on the gum, buccal and lingual, which can be tested as the shaping proceeds, extend it beyond the cervical margin of the cavity and around the embrasure to the buccal and lingual surfaces of the tooth; at the occlusal margin of the matrix a portion should extend, forming a lip when bent down. We would call attention to this lip as an especially important feature; it is intended to rest on the mesial or distal ridge, as the case may be, of the approximal tooth. It helps to fix the matrix in place, prevents forcing the matrix on to the gum, and presents a rounded edge, which can be more readily filled to. Another feature, of minor importance, is a hole punched in the buccal and lingual extensions to aid in the removal of the matrix.

The *double slip* matrix is a duplicate form of the single slip, connected at the occlusal edge and bent entirely over, one on the other. The double slip matrix may be used where two cavities in different teeth approximate the same space. It is employed in order to avoid the necessity for shifting the single matrix when the introduction of the filling material in one cavity is completed.

The single slip matrix should be applied by slipping it between the teeth beyond the cervical margin of the cavity, around the embrasures to the buccal and lingual surfaces, the lip at the occlusal margin resting on the ridge, mesial or distal as the case may be, of the approximal tooth, the cervical third closely wedged. By this method of application the matrix is stayed at four points—the buccal and lingual side extensions, the ridge lip, and the cervical portion, where it is wedged.

With the flexible slip matrix there may be slight yielding at all points, or there may be some fixed portions and others yielding; the operator may select which method of adaptation is best for the case in hand.

We are decidedly of the opinion that with few exceptions the slip matrix should be applied as we have described, and that it should be wedged to the exact margin at the cervical third of the cavity. The mechanical wedge may serve the purpose in many cases, but the wooden wedge, shaped to fit the interproximal space, beveled so that it will not injure the gum or tear the rubber dam, moistened with sandarac and forced well into place, meets fully the requirements.

The matrix should yield at the middle third, and more so as the occlusal third is approached.

The cervical third of the filling should be as near as possible completed with the condensing of the filling material, so much so that approximal trimmers and a narrow thin strip, fine grit, would complete the operation at that margin.

The buccal and lingual margins are more readily approached for finishing; the yielding of the matrix will allow slight overlapping of these margins of the cavity with filling material, and sufficient yielding of the matrix to give the proper contour. All space necessary for contouring and knuckling at the point of the approximal contact can be gained in this way.

With the readily-made matrix in mind and applied, many emergencies can be met and results insured which could not otherwise be attained; as an instance, a cavity on the approximal surface of a molar extending well up to the process. The rubber dam and ligature cannot be made to clear the cervical margin of the cavity. A matrix can be fitted so that it will extend beyond the cervical margin of the cavity and not impinge on the gum, buccal or lingual. In placing a matrix of this kind, the rubber dam, being on the tooth but not clearing the cervical margin, is forced back; if caught by the matrix and overlapping the cervical margin of the cavity, after wedging the matrix close at this margin the overlapping rubber dam can be dissolved away with chloroform.

If the filling material to be introduced is plastic, as will be the case in most instances of this kind, the matrix can be wedged firmly against the cervical margin of the cavity with cotton moistened with sandarac varnish. In many cases it will be best to depend on exactness of adaptation of matrix at the cervical margin for the final finish at that margin.

The form of instrument for introducing gold into a matrix-bound cavity has not received the attention it deserves. Nothing is more annoying or likely to bring about uncertain results than to have the instrument pass between the matrix and the tooth-margin, forcing the material beyond control where the matrix is yielding. Many may condemn the yielding matrix on that account. This difficulty can be avoided, at least so far as results are concerned, by the use of the right form of instrument. This is simply a rounded-from-the-shank working-point, long contra-curve instrument, right and left. The wedging is avoided by the long curve of the instrument working against the inner surface of the matrix, and the round working-point, which is not so liable to wedge as the angular working-point. Parts of cavities difficult of access may be approached with these instruments.

Owing to the fact that the working-point is on a line with the axis of the shaft and shank of the instrument, it is practically a straight instrument and can be used from start to finish with many fillings, having the additional advantage that the line of vision to the working-point is not obstructed.

The details in the operative procedure which we have recounted may seem trifling, but, as has been well said, "Trifles make perfection, and perfection is no trifle."

PROCEEDINGS OF SOCIETIES.

PENNSYLVANIA STATE DENTAL SOCIETY.

Thirty-seventh Annual Meeting.

(Continued from vol. xlvii, page 1490.)

TUESDAY—*Morning Session.*

(Continued.)

Dr. INGLIS (replying to the observation made by Dr. H. B. McFadden, "I think the scheme Dr. Inglis suggests is going back to the subject of educating parrots"). I would like to correct the misapprehension of Dr. McFadden. I do not mean to limit the subject to six hundred questions, but if necessary have two thousand questions to bring out the principles underlying a branch. The object is to establish some sort of basis upon which the men may be examined. At the present time the student has no idea upon what subjects he will be examined. The questions without answers appended are a great help to the student in study, as the questions center his attention upon point after point of importance without repetition, whereas frequently he wanders aimlessly through a subject.

Dr. G. W. KLUMP, Williamsport. I rise first to commend this paper. It is the best paper on this subject I ever had the pleasure of hearing, and is instructive to all of us, whether student, examiner, or teacher. In line with the idea advanced as to the instructive value of quizzes following lectures, I would like to suggest to the teachers that at some of these quizzes they require the whole class to write the answers. It will doubtless be a revelation to the teachers to find that many students are utterly unable to write a clear, intelligent answer on any question submitted to them on a subject that they apparently understand quite well. Practice in writing answers to questions would not only be an advantage to them in examinations but would help them to form the habit of mentally acquiring knowledge in proper order, and would improve their ability to express themselves more intelligently in conversation or writing.

In the matter referred to about the board not giving sufficient importance to practical work. The Board of Dental Examiners mark the practical work, but the marks are not counted in a general way in making up the general average. The law does not so direct us. The law says that the applicant is to be examined in the ten branches named, that a general average of seventy-five must be made, and that the applicant must produce satisfactory specimens of practical work, so that the board has no power or authority to count this practical work in the general average as a passing mark on the examinations. Unless the law is changed in that respect the board will have to continue doing as it has in the past. If any changes are required on that basis, it will be necessary to change the present law. In some cases where very fine practical work has been shown and the applicant had not quite reached a passing mark, he was passed on account of his excellent practical work.

There is another reason that has not been fully brought out as to why certain students fail before the boards that do not fail in the college examinations. Every teacher, probably every man, has certain methods, certain ways, and possibly certain fads, and makes a certain part of a subject of more importance than others, and is likely to give it importance by the emphasis he places upon that part both in his lectures and quizzes. If he considers it particularly important he may incorporate it in his questions, so that the student is likely to know to a certain extent how the teacher wants a certain question answered, and of course may be able to answer it by the way the teacher asks it, and yet when that same question is put in another way he may not be able to answer it. Of course an intelligent man understands and comprehends a question and is able to answer a question of the board as well as one of the college teachers.

There is no doubt that manual training is a very important part of dental education, but the law does not provide for that in any way. I have always advocated, and still do, that the greatest advance in dental education today would be to require every student before entering the college to spend some time in the office of a private practitioner for manual and mechanical training under the direction of a preceptor. If that was required I know (and I have had some few assistants in my time) that I would very much prefer to hire an assistant brought up as a student in the office of a practitioner than one who had never been in an office but had been trained simply at college, and I think the experience of a great many others will bear me out in the conclusion.

Dr. SCHAEFFER (closing the discussion). I have not very much to say. In the first place, I was glad to hear that the dental colleges need more money. Somebody gave over a million dollars to the Princeton Theological Seminary lately, and at a banquet afterward one of the professors of the university said that the Princeton Theological Seminary now has two million dollars, and does not need the two million any more than a dog needs two tails. I hope when the next Evans gives his millions to Philadelphia he will put them into some of the colleges already in existence.

In another line of work. I once heard of an examiner who wrote "ninety" on a piece of paper and "one hundred" on another, and laying the examination papers between these two papers said that all his papers were "between ninety and one hundred." Nothing of that sort is possible in the Pennsylvania State Board of Examiners because the papers must be filed for inspection. People have come time and again to Harrisburg to complain of the markings of the board, and they have gone away silent as a clam. Now, I think this should be stated as evidence of the honest and fair work that the dental and medical boards have been doing.

As to the severity of the examinations, I of course cannot speak as an expert along dental lines, but I would know at once what was a fair examination in history, geometry or arithmetic. In my opinion the dental examination should cover the minimum amount of theory which the dentist must have in order to do satisfactory practical work.

This morning when I was going to the train, a missionary from Japan told me that in Japan the people who are to become dentists are taught to pull plugs out of wood with their fingers when young, and by the time they are grown they can pull teeth with their fingers. This is a simple bit of Japanese wisdom in the direction of manual training, and I don't believe the public schools will do satisfactory work in sending students to dental colleges until manual training becomes more widely diffused. We all know that there are nascent periods when a child or youth wishes to do certain things. The boy, for instance, wants to work with his hands, the girl with the scissors, etc., and if during the nascent period of a given desire it is not cultivated it passes away and a certain amount of skill is never attained.

When the present law was before Governor Hastings for consideration, I was requested to go to him and make an appeal for his signature. After listening to my speech, he said, "Dentists live inside of a tooth until they become cranky, and I believe they should be given an examination." He signed the bill. I want to say in honor of the profession, that I have not found them narrow although they do spend a good deal of their time inside the teeth. I have found them very liberal in their views, devoted to their profession, and grand servants of this grand commonwealth.

Dr. LITCH. Before we adjourn, I move that a vote of thanks be extended to Dr. Schaeffer not only for his splendid address this afternoon but for his admirable services to the dental profession in the state of Pennsylvania as an officer in the Dental Council of the state.

Motion carried.

Motion was then made and carried that the society adjourn until 8 o'clock P.M.

TUESDAY—*Evening Session.*

The meeting was called to order Tuesday evening, June 27th, at 8.30 o'clock, by the president, Dr. I. N. Broomell.

The minutes of the previous meeting were read by the secretary, Dr. J. W. Cupit, and there being no corrections were approved as read.

Reports of committees were called for, and there being no committees to make report, the President announced as the next order of business the reading of a paper by Dr. M. I. SCHAMBERG, Philadelphia, on "The Surgical Treatment of Chronic Alveolar Abscess."

[This paper is printed at page 15 of the present issue of the COSMOS.]

Discussion.

Dr. W. J. ROE, Philadelphia. I have not performed this particular operation; therefore I am not in position to speak with authority. However, I have to say that I believe this is a very timely paper, a paper that deserves careful consideration, and a paper which I believe will improve with consideration when read carefully and considered at your leisure. It deals with the surgical treatment of chronic alveolar abscess. The treatment of alveolar abscess is necessarily surgical, but this is a special surgical treatment—a radical surgical treatment—and in my opinion a necessary surgical operation in many cases. The importance of curing alveolar abscesses is little appreciated and little considered by the laity, and too frequently little considered by the profession. It is too frequently the case that patients are having prolonged periods of chronic abscess. Now from the medical and surgical point of view we consider this a very dangerous condition; it is a condition that should not be permitted to exist, but should be cured as early as possible and cured by any means at one's command. If the ordinary treatment of alveolar abscess is not sufficient—and Dr. Schamberg tells us that in many cases it is not, and that if the apical portion of the root is not exposed it cannot be properly treated—therefore for that reason, and others that he has given, these abscesses remain uncured by the ordinary means.

I have considered his paper thoughtfully and carefully, and I have known of the work that he has been doing upon this particular subject, and I agree with him in every particular with probably one exception. I agree with him in the causation—the etiology—of these chronic alveolar abscesses, that they are due to not properly reaching and treating the apical portion of the root, consequently causing a focus of infection to remain in that region leading eventually to a condition of chronic alveolar abscess. Therefore, to correct this in the apical regions it is necessary in many cases to perform the operation that he has indicated. I would, however, call a word of warning, and that is that it may lead to careless treatment of root-canals. It is as necessary to thoroughly attempt to overcome any difficulty of tortuous or inaccessible root-canals, and if that fails then I believe thoroughly in what he has indicated. The one other word of warning I would sound is not to resort to this operation in badly diseased, hopelessly diseased teeth. The profession I fear has gone in many cases to the extreme in attempting to maintain hopelessly diseased teeth to the detriment of the patient and frequently to their own embarrassment and loss. I am persuaded more and more, as I have more experience in medicine and surgery, that this is too frequently the case; that dentists being so competent and capable, having so many accessible means of attempting to save (and do save with a reasonable degree of success) hopelessly diseased teeth and to maintain these teeth in position, do so not to the welfare of the patient. Patients are frequently seized with severe surgical illness or severe medical disease and their lives are often jeoparded by the presence of badly diseased teeth that have been very successfully manipulated or patched up, if I may use that expression. Therefore, there is to be due conservatism in the application of this treatment. In other words, please do not attempt by the operation on the root of a tooth to maintain in position hopelessly diseased teeth. I considered myself conservative when I was engaged in the general practice of dentistry, but I am much more so now. I would not now attempt to maintain in position and preserve the function of teeth that I did at that time, because teeth that I maintained at that time would, especially during a severe illness, give rise to serious complications and often endanger the life of the patient.

Now the point that I want to call attention to, and where I take exception to the essayist, as I said, is not in the operative treatment, but in the after-treatment. He has told you that it is best to pack these cavities until they are practically obliterated. Now that is exactly what I say not to do, and it is not what I do at the present time in similar cavities. I have already told you that I have not performed the operation in question, but in similar cavities in the maxillary bones similar in many respects, I do pack the cavity for probably twenty-four or forty-eight hours, but I then remove the iodoform gauze and rarely repack that cavity. During the tissue-forming process of repair, pressure is not desirable. The cavity should fill up with granulation tissue as rapidly as possible, and it will do so in the absence of pressure. When you extract a tooth what do you do? Do you pack the cavity in order to get it to fill up? No, you do not. You extract a tooth and usually let it look out for itself. But where anything else is done, the cavity is properly irrigated by proper solutions to maintain a relatively aseptic condition, and that cavity becomes obliterated by the process of repair. That tissue first becoming fibrous goes through the natural process of repair and ossific material is formed, and the same thing is true of these cases in many instances, I think. I am sure if the essayist sees fit to take my suggestion that he will find these cavities obliterating very rapidly. Packing is necessary where a small opening is made into a cavity and where drainage has to be established, especially in bell-shaped cavities; but what is indicated in these instances in preference to packing is to make a large opening, convert the bell-shaped cavity into an open cavity, and after doing that if a relative aseptic condition of the cavity be maintained by proper irrigation the cavity will look out for itself and will be obliterated in the course of two or three weeks. If it does not, something will be found in the cavity which has interfered with the process of repair.

Dr. C. M. BORDNER, Shenandoah. I have treated a number of these cases in the heroic manner that Dr. Schamberg describes. The history of one case in particular I wish to give to the society. It is the case of a rather anemic gentleman about thirty years of age who presented himself with a swelling on the lower left buccal side, with a chronic abscess on the lingual side, arising, as I supposed, from the posterior root of the first molar. I opened the canals of the molar and cleansed them thoroughly with hydrogen dioxid and mercury bichlorid, followed with a dressing of glycerin, carbolic acid, and iodoform. I then opened the fistulous opening on the lingual side with a No. 11 round bur. I syringed with hydrogen dioxid, using a hypodermic syringe, extending the needle to the buccal side. I repeated this once a day for two weeks, in the meanwhile instructing the patient to use a compress at night. During this period of two weeks pus exuded through the lingual opening on using pressure on the buccal side. I therefore syringed with a fifty per cent. solution of sulfuric acid and put the patient on a systemic treatment, using Phillips' phospho-muriate of quinin compound. Within one week all pus had disappeared, and upon seeing the patient a year afterward found the tooth and gums in a healthy condition.

I agree with Dr. Roe in that the gauze packing for these openings is not necessary. The method the essayist speaks of is rather heroic, but in quite a few cases it is absolutely necessary to their successful treatment.

Dr. Wm. Jarvie, Brooklyn, N. Y. I have listened to the paper with a great deal of interest and pleasure. If there is anything that causes us annoyance and sometimes discomfiture in our practice it is these chronic alveolar abscesses, and the treatment that has been suggested tonight is one that will undoubtedly cure many of them. While the cause of almost all alveolar abscesses is the same, namely a dead pulp, in many cases the removal of that pulp and all septic matter from the canals will cure the abscess; in many old chronic cases it will not. If the abscessed condition has left the end of the root rough and intolerable to the soft tissues surrounding, nothing but the removal of that rough part will cure the abscess, even where the root-canals are most perfectly filled, and I think the manner of amputating such roots and filling—completely filling—the root-canals from the apical end in the manner which has been demonstrated tonight is just what is needed in many of these cases. The pictures shown are most perfect. I have never seen a series of skiagraphs in my life that seemed to be so perfect, and it is an evidence of what electricity combined with photography is doing in the way of helping us in the treatment of diseased conditions.

Dr. James Truman, Philadelphia. I was impressed, sitting here listening to the paper, with the fact that one discovery always supplements another. When in the years past a man performed this operation of removing the ends of the roots of teeth he had nothing to test his work, and it was not until Roentgen brought out the discovery of the X ray that some of the young members of our profession—and among others my friend Dr. Schamberg—were able to do such excellent work as has been presented here this evening. I, however, am not prepared to indorse the statement made that in alveolar abscess there is *occasionally* the necessity for the removal of the diseased ends of the roots of teeth, for I go farther than that and assert that no root which has been abscessed can ever be in a healthy condition. Now, the idea has prevailed in dentistry almost since my memory lasts that by a certain medication through the roots alveolar abscess may be cured. It is utterly impossible that any alveolar abscess can be cured by such a method. They can produce toleration, so that nature will go on perhaps for years, and perhaps a lifetime, but that root, a portion of it at least, is always in a necrotic condition. How can it be otherwise? An abscess necessarily involves the peridental membrane, and that membrane when it becomes absorbed or diseased separates from the cementum at the end of the root of the tooth, and I hold this to be a universal result. Therefore, I do not agree with the idea that it is exceptional that this operation must be performed. While, of course, it may not always be advisable or necessary, but where a necrotic condition exists there always will be an irritant, and eventually there will be á fistula re-established after it has been apparently cured. Therefore I think that the dentists of today and for all time past have labored under an error in regard to this matter. I hope Dr. Schamberg will qualify his words, and I want him to say positively whether this is not absolutely the truth.

Dr. T. C. Stellwagen, Sr., Philadelphia. I approach this subject with fear and trembling, having been forty years suffering from abscesses. I am falling away, but there is too much of me yet in the way of flesh. Two bicuspid roots which were crowned with gold are now in my mouth. They have been dead for several years and the natural crowns broken off almost thirty years ago. I am keeping these roots to study the pathology and prepare a history of the disease that is eventually to attack me. Three or four more old roots are about my mouth that have abscesses when they feel disposed to, but strange and contradictory as it may seem I am still alive, and a good deal alive. The meaning of all this is that you must not imagine that every root that has an abscess on it must be cut off and trimmed; the operation is entirely unnecessary in a great majority of cases. There is only a small percentage of such cases that are certainly much better if treated and gotten rid of. Very rarely it is required to cut off the entire end of a root. Opening through the alveolar walls with a good-sized sharp bur, reaching the end of the root of the tooth, cleaning and curetting with the bur, generally will cure an abscess immediately.

The packing of the cavity I am very glad to hear Dr. Roe take exception to, because it is unnecessary and delays very materially the process of repair. Nature cannot throw out granulations to obliterate the space if it is filled with cotton. It may be well to insert a seton to keep the fistula open through which to wash out and thoroughly cleanse the parts with a disinfectant in distilled water. One great favorite douche is water slightly colored with a few drops of tincture of iodin. Half a dozen other remedies are suitable for the purpose, spraying them into the space by means of a compressed air apparatus once or twice daily for two or three days, and then every other day generally is sufficient; if not, it may be advisable to again use the bur, following with the iodin wash.

With regard to the case shown which was in the roof of the mouth, some years ago I had an interesting one of this kind. I made a large opening to the apical region of the tooth, and after clearing and washing it out kept it drained; at the end of a month or six weeks it was healed and never gave further trouble. The opening for a day or two may be packed, but very rarely is this needed. The burring off of the extreme end of the roots is good in some cases, but it is generally only necessary to remove the surface of it. Of course if the operation is thoroughly done, the balance is a simple matter if the general health of the patient is good.

There is one point that I would like to impress upon the younger men of the profession, and that is the importance of thoroughly filling the root-canals of pulpless teeth. It generally takes two or three minutes to do that. Formerly it used to take me an hour and a half. Fill the roots with wax and rarely will trouble result. Of course you are all familiar with the manner in which this is done.

I do not use the broach for removing dead pulps to the extent that many do. A sharp orange-wood toothpick saturated with alcohol or an appropriate medicament is sufficient. For cleansing the root-canals with the wood points, use one after another repeatedly. If you don't succeed then, use the broach, or you may use what my attention was first called to by Professor Litch, a red-hot wire or thin broach. That is a sterilizer in earnest, and after two or three applications before the wax sealing is inserted rarely any trouble ensues where the wax has been properly placed. One good feature of the wax filling is that if you happen to push a little through the end of the root it is not injurious at all. It can scarcely be said to irritate under any condition. In teeth where I have been unable to reach the apex of the root, I have been doing some experimenting with forty per cent. solution of formaldehyd. Take a toothpick or a broach and put a mere fraction of a drop of formaldehyd into the root, then fill on top of that with the wax, gutta-percha, or some gas-tight material. So far my experimental cases are doing well; some of them I have seen almost every day. The idea is probably not new or novel at all. When on a trip in Delaware Bay I caught an unusually large jelly-fish, and wishing to preserve it I put it into a vessel holding two or three gallons of water, to which was added two or three ounces of formaldehyd solution forty per cent. The mollusk was brought to the city and has been on exhibition in the Philadelphia Dental College Museum for several years without any change of the solution. A month ago it looked the same practically as it did the day it was put into the jar. There is no decomposition taking place, none whatever. This gave me the idea of using this preparation in preserving pulp-substance in tortuous roots, and so far the method has proved successful.

Dr. C. H. LAND, Detroit, Mich. It has been my effort for a great many years to save all the tooth-structure possible. I have had the opportunity of almost forty years of experience in the treatment of roots, and so far as the method presented by the essayist is concerned, in all these years of practice I have seldom found it necessary to resort to it. I have had, I think, about six or eight cases almost identical with those mentioned in the paper, the only difference being that I lacked the aid of the skiagraph. My method consists in pushing the tissues in the direction of the apex for three or four days until I have exposed the diseased portion. If I find at the end of the root any necrosed tissue, I simply remove it, using the dental engine bur, held or supported so as to cut uniformly, incising the end. I have never found it necessary to remove any more than I found associated with broken down tooth-structure. In the majority of cases it has been my experience that nearly all can be treated successfully, especially the anterior teeth, without resorting to the heroic methods. I simply reserve the surgical method where I fail with the other. Always try the easier method first, and the other only as a last resort.

I would like to corroborate what Dr. Stellwagen has said with regard to the treatment of root-canals with formaldehyd. I have been in the habit of using a ten per cent. solution in the roots of teeth, especially in the lower molars. This I have practiced for almost ten years, and whether I ever got the cases back or not, I do not know, but I have hardly ever failed when using this drug. The preparation must not be too strong as it will irritate the tissues, but even in a slight irritation a gentle massage of the tissues will generally control the irritation. I very frequently open the pulp-canals of teeth and find in them plenty of pus. I simply clean them out with alcohol and then enlarge the canal for quite a distance down, let it rest for a day and keep it open to give nature a chance to get rid of the pus. The roots are then treated with formaldehyd, and the result is invariably excellent. In connection with this, and to show you how kind nature is in restoring conditions under certain circumstances, one of my patients had a right lateral tooth with a jacket crown on it, which I remember Dr. Thomas of Detroit cut off, replanting the root, about thirty-one years ago. I have had the care of this patient since, and as there was a constant tendency to pyorrhea, this tooth was finally lost. It was largely due to the carelessness of the patient in not coming to me frequently enough for treatment. I have the tooth here to show you, and you will find on examination that on three-fourths of its surface the peridental membrane must have reunited very firmly or it would never have preserved the root so many years.

Dr. SCHAMBERG (closing the discussion). The suggestion Dr. Roe offers of allowing the wounds to remain open is one which I have tried and have found unsuccessful. The reason for it is this: If we attempt to remove that diseased tissue and then allow the wound to remain open, the tendency is for the external opening to close before the inner portion fills up, re-establishing there a non-septic cyst, practically what takes place in the cases referred to by Dr. Truman. Dr. Truman says that no abscess is absolutely cured, and in the majority of cases I am inclined to the same belief for the reason that we merely render that tooth tolerable. It will be tolerated by the tissues because the apical end of the root has been treated antiseptically, thus creating a non-septic cavity. We know that nature abhors a vacuum, and that cavity cannot remain there without something in it, and the tendency is for it to fill up with serum. We then have a non-septic cyst that will give the patient no trouble until an attack of illness, by decreasing the vital resistance of the body, may encourage the micro-organisms to migrate into the cyst and set up a secondary abscess of the chronic type. I have attempted in a number of cases of this kind to keep the cavity open without packing, and invariably the external opening will close before the inner portion fills. I have found many failures in cases of this kind owing to the men growing tired of treating the cases—tired of packing the cavity until it is naturally filled up.

Dr. Stellwagen is a very healthy specimen of man, and I am glad to know that his alveolar abscesses are not impairing his general health, but many of our patients are not so fortunate, not so corpulent as the doctor is, and have little to spare of flesh and blood, and for that reason we must take a large proportion of these cases into careful consideration. I believe we cannot estimate the amount of harm done by the swallowing of pus from a chronic alveolar abscess, and our effort should be to cure it by some means or other. If we cannot cure it by treatment through the canal, we should try the surgical treatment, and if that fails the tooth should come out. We should not allow that pus to lurk in the mouth.

The great trouble with Dr. Stellwagen's treatment is that one cannot reach the diseased area by making a small opening into the pus-cavity. The entire portion of the tooth is bathed in pus, and the chances are that the trouble emanates in the canal at the apical end of the root. Now, why should we retain the apical end of that root which has been so troublesome if we hope to cure the case? If it is allowed to remain, a return of the former trouble may be expected, and in order to avoid this the operation must be done thoroughly and with every attention to detail.

On motion the subject of Dr. Schamberg's paper was passed, and the meeting adjourned until Wednesday morning at 9.30 o'clock.

WEDNESDAY—*Morning Session.*

The meeting was called to order Wednesday morning, June 28th, at 10 o'clock, by the president, Dr. I. N. Broomell.

The first order of business was the reading of the minutes of the previous meeting by the secretary, Dr. Cupit.

There being no corrections, the minutes were approved as read.

The next order of business as announced by the President was the report of the Committee on the Enforcement of the Dental Law, by Dr. F. D. **Gardiner**, Philadelphia, chairman, as follows:

Mr. President and Members of the Pennsylvania State Dental Society:

It is the purpose of your chairman this year to make a comparatively brief report, as in former years the policy, methods, and recommendations of your committee have been fully outlined and considered.

Our convictions have not changed, and we continue and emphasize our recommendations. Further experience but confirms the views advanced with all earnestness in former reports.

We are sorry, however, to report that the discouragement of your chairman has become profound, as when put to the practical test it has been demonstrated beyond all question that only a very small percentage of the profession will financially support the dental law and its enforcement.

The inference is plain, that unless your committee is financially supported it might as well not exist. It is absolutely useless for your committee to endeavor to enforce the law when it is not furnished with money to pay expenses when prosecutions become necessary.

No doubt a very large proportion of the profession sentimentally sympathize with and believe in dental law and its enforcement provided others than themselves do the work and pay the expenses for the privilege of so doing.

The brilliant result achieved, after strenuous and faithful effort, by your committee appointed to raise funds for the Enforcement of Law and Legislative committees, is a sad commentary on the enthusiasm of the profession on this subject, as up to the present time barely enough has been collected to defray the actual expenses of the Legislative Committee for counsel fees and incidentals.

It is imperative for our best welfare that means be devised by which a much more general and unselfish interest can be stimulated in matters which pertain to the general welfare and advancement of dentistry as a profession. The business of our profession receives entirely too scant attention. It seems to be almost overlooked that these business matters are most important and a necessary adjunct to our scientific work and advancement.

This society, standing as it does as the only representative body of the whole profession of the state, should devote a large share of its time and energy to the discussion and promotion of these business matters of dentistry.

We believe that practical steps should be at once taken to largely increase the membership of this society, and to bring into close alliance with us the whole society element of the state, to the end that our influence for good with the profession and in the protection of the public welfare may be enlarged and extended, that incidentally our revenues may be increased and the means provided for the necessary practical work.

The ways and means for doing this are not within the province of this report to discuss, but the need of the result urged is only too apparent.

Your chairman has continued for several years to work earnestly as best he could with the means at his command for the better enforcement of the law and to perfect our legislation, because he believed the work was necessary and important, and that much good might result.

Results have been accomplished and methods and recommendations have been yearly indorsed and approved by this society; but the profession has not, when appealed to, responded with the necessary financial support. What is to be done?

We had confidently hoped and worked to be able to report at this meeting, as a culmination of the work of five years, that an improved and far more efficient law had been placed up the statute books of this state. But in this we also have been disappointed—and this after all the work had been successfully performed. Our state of mind can be better imagined than described. But in this respect we are not discouraged. Our present law is still in force and should be enforced until the next session of the legislature.

F. D. GARDINER, *Chairman.*

On motion the report was accepted.

The President then announced as the first paper for the morning session that by Dr. M. L. WARD, Ann Arbor, Mich., on "Some Things About Alloys Not Generally Understood."

[This paper was printed in the December 1905 issue of the COSMOS, vol. xlvii, page 1423.]

Discussion.

Dr. E. T. DARBY, Philadelphia. Dr. Ward made one or two statements at the beginning of his paper the correctness of which I am a little inclined to question. One, that prior to Dr. Black's experiments we had no hard alloys—that is, alloys containing more than 62 per cent. of silver. More than thirty years ago in connection with my old preceptor, Dr. Walker, we experimented with alloys containing 62 per cent. silver, 36 per cent. tin, and 2 per cent. gold. This alloy we found to be very quick setting, but under certain conditions we secured good results. Again, the alloys which Dr. Bonwill made presented every appearance of being alloys with a large percentage of silver, and I have never seen better results produced than those by Dr. Bonwill with his alloys. He claimed that he used in combination with the silver, tin and mercury and a large percentage of gold, making a saturated solution of gold in mercury, and with it he obtained results exceedingly satisfactory. Therefore, I think we had hard alloys before Dr. Black's experiments. Unquestionably, Dr. Black has done a great deal in the matter of alloys, and much to improve their character.

The trouble which some dentists have with the alloys containing a large percentage of silver, is that the working of them is not understood. They are quick-setting alloys unless annealed for a considerable length of time, as shown by Dr. Ward. An alloy annealed at 210 degrees of heat for one or two days sets much slower than one freshly cut, and they work differently in very cold weather or in a damp room. All freshly cut alloys set quickly, and all old alloys set slowly, provided they have not too small a percentage of silver in them.

Dr. Ward made one statement regarding the mixing of alloys with which I differ. He says they should be mixed in the mortar first and then rubbed in the hand. My experience is that they can be more thoroughly mixed in the mortar than when worked in the hand. I believe the metals are more thoroughly combined with the mercury and that we get better results. After mixing thoroughly in the mortar, I have my assistant take a clean napkin of fine linen and knead the alloy in that. It is objectionable, especially in warm weather, to mix alloys in the palm of the hand. It is an uncleanly procedure aside from the possibility of working mercury into the system. I think it is a mistake to mix alloys in the hand. Many have dirty hands, and mix with the alloy a great deal of dirt, and have not at the end of the mix what they had in the beginning. Alloys should be handled as carefully as gold foil.

Again, Dr. Ward does not approve of washing alloys. I was taught that it was good practice to wash alloys with alcohol. I did it for many years and often do it now. It has always seemed to me that the alloy had so much greater affinity for itself than for moisture that it could be made perfectly dry by kneading in a napkin, and that I had a much cleaner filling if I had first washed it in alcohol. I think dentists who mix their alloys in the hands would do well to wash their alloy before putting it in the cavity.

Dr. H. E. **Friesell**, Pittsburg. I shall confine my remarks to the application of amalgams, and not the making of alloys, because I believe there is just as much damage done in the improper application of the former as there is in the improper making of the latter.

Many a practitioner has concluded that because amalgam is comparatively cheap it is an inferior material, and that it should be handled in a cheap and inferior manner. I disagree with that view. I believe there are places where amalgam answers better, if properly applied, than gold would in the same position. I believe also, of course, that there are places where gold is far superior to amalgam. One mistake common to practitioners who consider amalgam a cheap material is in preparing cavities. The patient wants something cheap, and wants it inserted in a short time, and the operator prepares the cavity in a way different than for gold.

To my mind it is necessary to prepare cavities for amalgam as carefully and along the same lines as for gold. We expect neither amalgam nor gold to have any therapeutic effect or action on tooth-structure, and we therefore must live up to the mechanical requirements of cavity preparation the same as with gold, with the possible exception of being able to do without the starting-point for the amalgam filling. The cavity outlines must be extended to a surface that is self-cleansing or protected by the gums. The floor of the cavity must be flat. The walls must be at right angles to the floor, or nearly so, and the angle formed by the floor and any wall must be clearly defined. No rounded gingival wall is permissible; nor must dependence for retention or resistance be made upon grooves or undercuts.

Given the proper cavity, we must next consider the proper manipulation of the amalgam. After having prepared the mass as Dr. Ward has described, it must be placed in position and subjected to as great pressure as can be made without actual discomfort to the patient. Compression is the keynote in packing amalgam. To obtain compression, we must have the box-shaped cavity. It must also be a simple cavity (having four walls) or be made such by the application of a rigid matrix. Flat-faced pluggers, preferably with shallow serrations, are used to obtain greatest pressure. When the amalgam is condensed to place, the pressure should be maintained for an instant. One who is observant can feel when the amalgam is thoroughly condensed as easily as he can realize the same result when condensing gold. In burnishing the filling, only sufficient pressure should be used to smooth the surface of the filling toward the margins.

Amalgam fillings should be roughly finished at the time of insertion, and at a subsequent operation polished as thoroughly as if they were of gold.

A high-grade alloy will give satisfaction in proportion to the care expended upon its insertion.

Dr. WM. H. TRUEMAN, Philadelphia. I claim for my dear old friend, Dr. J. Foster Flagg, a great deal of credit for bringing about the vast change that has taken place in the status of alloy fillings during the last fifty years. He contributed to this by the work he began at the very commencement of his professional career, and continued all through his life—continued even until when in his last illness he could not rise from his bed. During my last interview with him, when he was too feeble to leave his room, he referred time and again to experiments he had then in progress looking to the betterment of alloys and other plastics, the results of which were promising and were soon to be made known to the profession.

His efforts to improve the plastics began when they were a byword. While appreciating their virtues he fully recognized their faults; he also recognized that much of the reproach associated with amalgam was due to professional prejudice. He therefore attempted a twofold task, eliminating its faults and making known to the profession its virtues, and thereby overcoming the prejudice against its use. Little by little this was accomplished. It was not all due to him. He was, however, always on the "firing line"—at times almost alone. Fortunately he lived to see the once-despised amalgam accepted as a valuable filling material, and the improved formulas and technics he had devised after laborious efforts, and had published for the profession's benefit, after the lapse of many years indorsed by scientists. Be it said to his credit that every little idea he gained from his experience or his experiments he promptly made known to the profession without fee or reward, just as soon as he felt that it was an advance. Notwithstanding the fact that he was himself in later years interested in the manufacture of filling materials, I believe he kept back nothing that would be advantageous to the profession, but kept his *confrères* fully informed through repeated editions of his work upon plastic fillings and his various contributions to the journals, of every advance he made.

Regretting that he has done so, I would chide the essayist for ignoring the important work done by Dr. Flagg.

I would not take from Dr. Black one iota of the credit due to him, but we must remember that the greater part of the problems concerning amalgam were practically solved long before he began his work. Dr. Flagg demonstrated that certain formulas produced good results, that certain other formulas produced inferior results, and that others again were unreliable. Dr. Black followed after Dr. Flagg, and by other and more scientific methods than those used by Dr. Flagg, has, in the main, merely confirmed his results. He has, however, undoubtedly placed the manufacture of alloys upon a more reliable and scientific basis; he has given us a little more confidence in that which was previously known.

I know something of the manufacture of alloys. It is, as nearly as I can recall, about forty-seven years since I cast my first ingot, and I have made many pounds of it since then. That was made from the old formula of four parts silver and five parts tin, and, let me say, amalgam made from alloy of that formula, properly mixed and properly used in suitable cavities, makes a thoroughly reliable filling. I say that after watching such fillings year after year for twenty-five or thirty years. It requires special treatment to get the best results, and that is true of all alloys. Every operator of experience requires certain methods of manipulation. Success in working amalgam will depend upon the operator selecting a formula that responds to his methods, or to his conforming his methods to the requirements of the alloy, quite as much as it does upon the character of the alloy. This I think is a point covered by the title of the paper; it is one of the things concerning amalgam "not generally understood."

We are indebted to Dr. Flagg for devising and making known a method by which these alloys can be accurately made. By the old methods—methods still taught by metallurgical books, and quite satisfactory when exactness of composition is not essential, the composition of the cast ingot differs with each melting. By Dr. Flagg's method the metals are placed in the crucible, fused, and cast into an ingot without the least change in the constituents of the alloy. There is no oxidation, but without due care there may be a slight loss if a volatile metal is used. I have repeatedly weighed ten ounces of the component metals, placed them in a crucible, fused, and cast them into an ingot that weighed exactly ten ounces. This is not the result of skill; it is due to Dr. Flagg's published suggestion to reverse the usual procedure and place the most fusible metals in the crucible first. This is another point "not generally understood," and it is seldom quoted.

It is impossible, and I presume it always will be, to use the same exacting care in practical work that the scientific investigator habitually uses in laboratory experiments. An alloy that makes the best showing in the laboratory may not be the best for office use. We need in our work an alloy that is not too exacting in its requirements; one that will give under the circumstances surrounding its use satisfactory results, not necessarily the best possible, but the best attainable under the conditions of actual practice.

Dr. C. C. Taggert, Pittsburg. When we consider the evolution of amalgam we certainly owe a great deal of the credit for this to men like Dr. Flagg, Dr. Black, and Dr. Ward, and men who have done this investigating for us. In attempting to formulate a discussion of the paper I am at a loss to find any weak point with which to combat. Possibly I may be taking away a part of the essayist's argument, but it seems to me that the argument advanced by the first speaker, that the dentist has dirty hands, is no argument against the manipulation of alloy. That is a matter that concerns the operator alone, and it is the duty of the dentist to have clean hands. One of the first things I ever heard Dr. Darby say was "Never approach a patient without a napkin in your hands;" and I think it applies also to the hands—we should never approach a patient without clean hands. I believe Dr. Ward has done honor to his subject, and we should honor him for his scientific contribution to our profession.

From the metallurgical standpoint I am unable to say anything, but from my knowledge of Dr. Ward in the last year, I am sure that the tests he has carried through have been done in a careful and scientific manner, and he well deserves a great deal of credit for it. I was impressed, as I hope others were, with the emphasis he put on the matter of the manipulation of alloys, and with the idea that the manufacturers give us practically what we need. After all, the problem depends largely upon the man who does the work. It is something more than merely pressing the button—the work must be done afterward, and that devolves upon ourselves.

In conclusion, I can only say that I cannot too highly praise Dr. Ward and the men of his kind who are doing this investigation for us.

Dr. A. P. Fellows, Philadelphia. I congratulate the essayist on the paper that he has given us, and I am sure that everyone enjoyed it and will profit by it. The subject is so complex and so great that it is difficult to take hold of it from any position. We know that there are only a certain number of metals which are put into amalgams, and they may be cut down perhaps to six elements. All of these have been compounded in varying percentages, and a certain percentage of this or that ingredient gives us certain results in the alloy. Silver has been used in alloys from the percentage of ten to as high as eighty. Tin has been used in almost as great differences of percentage. Gold, copper, and zinc and various other metals have been used, and certain ones have been discarded because of the qualities they give to alloys. I think after we have done all that is possible for us to do in choosing metals to enter into the composition of alloys, taking such percentages of each ingredient as have been proved to make the best alloy that it is possible to make, we shall then find that there is not at present a perfect alloy in the market, no matter where we go. There is not a single perfect alloy, and so far there never has been. I think we must look to other causes besides the compounding. That is to say, besides the choosing of the formula we must look to other causes than the manipulation of them for imperfect results. We know that all substances in a liquid form, especially when heated, will take up foreign substances. Take, for a single instance of this kind, iron. It does not even require the molten state for it to be contaminated with certain substances that are present in the furnace being liberated from the fuel while in the condition of combustion. Now, if that be the case with a single metal, and we know that all metals are quite capable of being contaminated, is it not easy to suppose that it would be wise in the making of alloys to eliminate all of these contaminating elements?

Dr. H. C. Register, Philadelphia. It has been a great pleasure to me to listen to Dr. Ward's paper, because I think the time has passed when any of us hesitate to say we use amalgam. We know today what can be done with amalgam, and the high place due to it as one of the great means of saving teeth. Dr. Ward is a metallurgist, and I am not, therefore my impression of the different alloys I have had experience with is based upon clinical association, and I consider that a good experimental field. In Dr. Ward's enumeration of the shrinkages of alloys I notice that with the exception of one or two there was shrinkage of not less than one ten-thousandth of an inch. Now, gentlemen, why do we fill teeth? We fill them for two reasons, one is to restore the tooth to its proper shape so as to restore its functional condition, and the other, which equals it, is to protect the tooth against a second invasion of bacteria. Now, one ten-thousandth of an inch won't do. Why? Because a microbe is only one twenty-five-thousandth of an inch in size, and in that one ten-thousandth of an inch a great many microbes can find lodgment along the margins of the fillings; therefore, if in operating upon the teeth we do not primarily take into consideration the main object in view—to protect the tooth against a secondary invasion of bacterial destruction—we are not getting what we are striving for.

In regard to the preparation of alloy, I agree with Dr. Darby, that every alloy we use should be washed just before using. Alloys should be washed for several reasons, and alcohol is undoubtedly the best medium for washing them. A first wash of a five or ten per cent. sulfuric acid solution followed by alcohol gives good results. We should wash alloys for the simple reason of taking away any oxidation that may be present, so that the mercury may come in contact absolutely with the remaining metal of which the alloy is composed. Not only that, but you do away with any of the accumulations that may exist there also, and I believe the mortar and pestle is the proper way of mixing alloys.

Dr. E. Parmly Brown, New York, N. Y. It has certainly been refreshing to listen to this very valuable and instructive paper on amalgam. Pennsylvania produced two of the greatest extremists in our profession, "New Departure" Flagg and M. H. Webb, and they both proved their premises—one that gold was an absolutely saving material in the hands of the skilled operator, and the other that amalgam was the best thing in the world with which to fill teeth. I agree with both of them, and I use both gold and amalgam.

When the new departure struck New York, I stayed in New York; I did not depart. When Webb came to New York, and we observed his beautiful operations, he said he hoped he might die before he ever put amalgam in a tooth, and I am sorry that he died instead of using amalgam; for we lost a great man. Both he and Flagg have gone to heaven; and if Flagg and Webb are in partnership in paradise, and they have exchanged views and come to their senses, they will fill teeth for the angels that will pass the muster of the inspectors of heaven.

Now, we are here; we are not in heaven, and that is why I use amalgam, and have been using it for forty years. That gold is a saving material no dentist will deny, unless he is a fit subject for the lunatic asylum—and the same thing obtains in regard to amalgam. There are a number of men who say they don't use it and never used it. I say I am sorry I can't convert them, but they are dyed in the wool, and I won't try to convert them. Some people from central Missouri who were old patients of my father's visited the office of a dentist in this state the other day and he examined their teeth. Two of them—a gentleman and a lady eighty-six years old—said that when they were twenty-one years of age they married in New York, and that my father filled some teeth for them at the time with gold, and they had never lost one of those teeth. Those fillings are today as perfect as if they had been put in last week, and that work was done sixty-five years ago.

Speaking of amalgam, a lady came to my office last summer for whom I had filled a lower molar with amalgam thirty-five years previously. The tooth was broken off next to the gum line, the crown and filling were still intact, and I told her I would put a gold crown on the tooth that would last thirty-five years more, making her ninety years old when the crown might come off. Amalgam is doubtless a splendid thing, and the dentist should not attempt to build up enormous molars with gold. Dr. Webb came to New York and filled a large molar with gold at one time which took him eight hours to build up. He prepared the cavity one day, and filled it the next. Dr. Webb died in four months, and the patient, Dr. Meggs, a dentist of New York, committed suicide in two months. I think that all back teeth starting with the upper and lower first molars should be filled with amalgam in nine cases out of ten. The anterior teeth are of easy access and can be filled with gold better than anything else, but the posterior teeth can be filled with amalgam successfully.

Dr. T. J. McLernon, Philadelphia. This is a paper that I have listened to with a great deal of pleasure, because I happened to be a student under Dr. Flagg, and naturally anyone who has been a student of Dr. Flagg's thinks a great deal of amalgam as a filling material, and, furthermore, takes a great interest in it. Amalgam is, I think, one of the main things in dentistry today for filling teeth. I mean by that, that in the nature of things everyone cannot have a high-class practice where nothing but gold is used, and therefore must use amalgam. Then the question comes up as to how we shall use it, and what kind of alloy shall we use?—and that is why I take this opportunity to speak. Some mention was made in the paper of the special kind of alloy that should be used. The essayist said he used a certain kind. Now I think we would all like to have the formula or name of the alloy he uses, or any method that will enable us to arrive at a knowledge of this subject.

One thing the essayist mentioned in his paper as an historical fact, I think is incorrect. He said that none of the old alloys contained a large percentage of silver—that is, were hard alloys. I read in Dr. Flagg's book not long ago that every amalgam that he intended for permanent filling material contained, I think, over sixty per cent. of silver. His alloy known as "J" has as much as seventy per cent. of silver in it. His "contour" has sixty-three and a third per cent. I also remember Dr. Moffit telling me years ago that Johnson & Lund were selling an amalgam made by his own formula which contained sixty-three per cent. silver. This simply goes to show that we had hard alloys many years ago. There are one or two little things omitted in the paper. One is in regard to wafering fillings. I am in the habit of putting in pretty good fillings, I think, and I wafer nearly every one of my amalgam fillings. One question I would like to ask the essayist. He says that a certain amalgam shrinks one ten-thousandth of an inch; I would like to ask what the bulk of amalgam is that shrinks that much. Another subject not mentioned is the expressing of mercury through chamois.

Dr. WARD (closing the discussion). The first thing I wish to say is to correct the impression that some seem to have that I intended to lessen the appreciation of the work of Dr. Flagg and others. That was not my intention. I designated one man only, Dr. Taft, and a man that I have thought most of. I designated him because he would lecture to us for hours on amalgam, and when he got through he would say that he had never inserted a filling of it in his life, and we went out not knowing anything about it. I am willing to concede that Dr. Black began where Dr. Flagg left off, and I am also willing to concede that we had hard alloys. I simply took this method of straightening things out, to try to get men to cease publishing articles that were written solely from the older literature in which there is nothing of any value when compared with our present knowledge of the subject. I took this means of straightening out these people and trying to get them to keep pace with the annual literature we have on the subject of hard alloys. The knowledge we have of alloys at present shows that those are best which contain silver, tin, copper, and zinc. The former alloys did not contain zinc. All of these contain silver in different proportions. One gentleman says that Dr. Flagg's alloys all had from sixty to seventy per cent. of silver in them. I have analyzed forty or forty-five specimens of Flagg's alloys and I have never found more than sixty per cent. of silver in them. Someone said he would like to have my formula. I would not have you understand for a moment that Dr. Black has any particular formula, as no formula can be depended upon, and the best alloys that we have today are the ones made without any special formula. You cannot more highly insult Dr. Black than by telling him that he has a formula. He is willing to admit that he has a plan but no formula.

· One gentleman asked about the size of the mass of alloy that would shrink one ten-thousandth of an inch. I said specifically in my paper that it was a block of amalgam one-fourth of an inch in diameter and the same in height.

Someone said that the older alloys, containing four parts of silver and five parts of tin, would save the teeth. I did not mean to give the idea that alloys containing a smaller percentage of silver would not save teeth, but I say that they cannot save the teeth as well. The figures previously given you indicate the ranges within which one must keep to secure the greatest number of desirable properties, and when properly adjusted will produce an alloy far superior to any alloy composed of four parts of silver and five parts of tin.

With regard to the washing of alloys advocated by some, it was once necessary to wash alloys containing sixty per cent. silver, ten per cent. copper, and from twenty to thirty per cent. tin. Dr. Black has proved that any method of washing alloys will increase the weight of the mass. I have never been able to completely remove any wash that I have ever used. The alloys at present which contain from sixty-five to sixty-eight per cent. silver, and two per cent. of zinc do not need washing.

With regard to the mixing of amalgam in the hand, I firmly believe that the hand is the only perfect method of amalgamating alloys. It can be cleaned very readily afterward, and there is no excuse for the dentist having dirty, oily hands.

On motion the subject of Dr. Ward's paper was passed.

(To be continued.)

MASSACHUSETTS DENTAL SOCIETY.

Forty-first Annual Meeting.

(Continued from vol. xlvii, page 1501.)

SECOND DAY—*Afternoon Session.*

THE meeting was called to order at 2 o'clock, Thursday afternoon, June 8th, by the president, Dr. E. O. Kinsman.

The President announced as the first order of business for the afternoon session the reading of a paper by Dr. HAROLD DEWITT CROSS, Boston, Mass., entitled "Maxillary Fractures."

[This paper is printed in full at page 29 of the present issue of the COSMOS.]

Discussion.

Dr. A. L. MIDGLEY, Providence, R. I. From my experience in the treatment of wiring fractures, I agree with the essayist, that they usually terminate in pus formation or necrosis of bone. In five cases treated in this manner, four terminated in necrosis and in the other there was a good but slow union.

In fractures posterior to the third molars I believe that it is not necessary to use a splint in more than two per cent. of cases, for there is generally little displacement and the fragments can easily be held with the skull-cap.

In eight cases in which the bandage referred to here by Dr. Cross was used, pressure was brought to bear upon the symphysis, the fragments pushed back in apposition and the teeth occluded so that a good alignment and no deformity resulted.

As regards the relative frequency of fractures of the maxilla and of the mandible, I believe that eight fractures of the lower to one of the upper jaw is about a fair average. The disadvantages of the Angle appliance are loosening of the teeth and breaking of the wires, due to muscular traction, and then the danger of a ligamentous union. In one case treated in this manner, two months after the appliance was removed the canine teeth abscessed, which condition I attribute entirely to the fact that they were made use of in this mode of treatment.

Dr. A. J. FLANAGAN, Springfield. We have in the hospital at Springfield a man who has a fractured jaw in which we cannot get union. It is a case of double fracture, and two physicians and one dentist have treated it for some time. We all three had the idea that we would like to send him back to New York for treatment, or else we would land in the insane asylum. These fractures in the jaw of a chauffeur were the result of an automobile accident while running at a speed of fifty miles an hour. The condition for which he was first brought to the hospital was a fractured shoulder, after which it was found that he had a clot on his brain, and a number of fractures of the jaw. His fractures consisted of one on the right side between the first molar and the first bicuspid. There was originally a second bicuspid between those two teeth, but we cannot find it and don't know what became of it. The space occupied by the second bicuspid is in a comminuted condition. The next fracture consisted of a direct fracture across the ramus of the jaw. The condyloid portion of the bone and the thin glenoid fossa were moved toward the brain because of the fact that he had a severe blow in the vicinity of the ear. The man was in an unconscious condition for several days, and on regaining consciousness we found he had a fracture of the maxilla which our first examination had not disclosed. That accident occurred four weeks ago, and during the last three weeks the mandible has been set eight times, but we have not been able to keep it in the position necessary for union. Now, I would like to get some information as to how to manage a fracture of the ramus. In all the literature that I could get on the subject of setting fractures of the ramus, the greatest consolation we could get was that fractures of the ramus are very difficult to control, and it may be necessary to resort to wiring. I came down here today to get information as to how to handle this fracture of the ramus. The gentlemen who preceded me said he could control fracture of the ramus without any appliance—that he never used any appliance back of the third molar. Now, I never heard of any appliance for use back of the third molars, and if there is any, it has not been my luck to know what it is. Our trouble has been with the fracture of the ramus. We had no trouble on the other side, as that fracture was very easily controlled, but when we set the fracture of the ramus it will not remain in position. Now, I don't know how we are going to get that jaw set in the proper position. The man is going to have a deformity, and in fact I think he will be fortunate if we have any union there at all. I am sorry that I did not hear the paper, as it may have touched on this, but I am very anxious to get some information as to how to set this case.

Dr. Midgley. I think that Dr. Flanagan misunderstood me. I did not mean to convey the idea that every fracture posterior to the third molars could be held with the simple bandage, but that the majority of fractures of the ramus or angle could be successfully treated with this bandage. There are exceptions, however, especially in that class where there is great displacement. I know of no appliance that can be used posterior to the third molars, but in those cases with the fracture at the angle or through the ramus, the interdental vulcanite splint with the bandage seems to hold the fragments in apposition most excellently.

Dr. Cross (closing the discussion). I hardly think that I can suggest any particularly feasible manner to hold the ramus in position. I have never seen a fracture where there was an upward displacement of the condyle spoken of by Dr. Flanagan. Something over four hundred fractured jaws have come under my attention, and I never saw one of this kind. It is a particularly serious thing, and of course must cause considerable difficulty in retaining the jaw in position. The ordinary displacement caused by the fracture in the locality of the angle of the mandible or in the ramus, is that the ramus portion is raised while the anterior fragment is depressed. The raising of the fracture is due to the action of the muscles. Where the condyle is in the socket the muscles hold the posterior section in place without any other appliance excepting possibly the pressure of the chinpiece, which can be extended back and hooked around the angle. I am very much inclined to think that in the case spoken of, wiring will have to be resorted to. Ordinarily we treat fractures occurring in the ramus by means of Dr. Angle's appliance of the interdental splint, taking great care to get the proper relation of the parts. After trying the interdental splint and chinpiece with the hook extending around the angle, and pressure applied at the point of the condyle, if that fails to hold the jaw in position, I should recommend incision and wiring.

I thank you for the kind attention with which you have received my remarks.

The subject of Dr. Cross' paper was passed, and the President announced as the next order of business the reading of a paper by Dr. C. H. Gerrish, Exeter, N. H., entitled "Outside of Dentistry," of which an abstract here follows:

Outside of Dentistry.

It is almost impossible to realize the value of carefully polishing the teeth at the time of cleaning them, by use of Arkansas stones and others of very fine grit, finishing with strips and rubber disks wet with pumice-stone and chalk, unless one has already tried this method and found what a perfect surface can thus be obtained. Its great value is the result that the teeth simply do not take on decay. Let me ask you a question.

Did you ever note how rarely decay takes place on the labial surfaces of incisors suffering from erosion? Put a strong glass on teeth thus affected and what do you find? Very highly polished surfaces, and from my observation practically immune from attack of caries. A perfectly polished tooth will resist decay for years, and while the use of germicides may be of much value as a prophylactic, they do not compare with pumice-stone and the orange-wood stick. My patients sometimes say, "Do you not take off the enamel, and won't the teeth decay faster?" My answer is, If enamel preserves teeth, why so much need of the dentist? If you will remove the enamel by degrees, keeping the underlying dentin polished, you have a structure entirely unlike anything in the mouth, which will resist decay for many years. I think the tooth-structure is stimulated by this polishing, besides affording no abiding-place for bacteria.

To you younger men: Let me interest you in this feature so comparatively painless especially to little patients. Treat them often, and the results will be surprising

Possibly you think this outside of dentistry as practiced today. Where are we drifting to in dentistry? Take the food question—cereals, mush, soda crackers, ginger-snaps, social tea and other sweet crackers, with plenty of acid soda waters, and you have a grand foundation to work on—*i.e.* commercially.

Many years ago I had the honor to be the partner of one of the finest operators in the land—a finished mechanic, curious worker in metals, high in his ideals, ethical in his practice. For over forty years he labored, reaching a state of almost poverty, then crowning the practice of a lifetime by inventing, manufacturing, and advocating the use of whole-wheat hard-baked crackers, calling them Dr. Johnson's Educators. Possibly this is outside of dentistry.

Again, the drift of our dental conventions and their value to the young practitioner. What find we? Papers of the highest order, scientific, the result of extensive reading and research, most of them going over our heads rather than into them, many of the clinics misleading. What the expert does with such ease and certainty, the tyro undertakes only to utterly fail and become more than discouraged. Would it be audacious in me to suggest a clinic on how to prepare and put in a silver filling or amalgam? Also a gutta-percha filling—not forgetting the mixing and filling with cements? Or how to take a perfect impression? the treating of the model of a hard or soft mouth so as to get a perfect-fitting plate?—some of the common operations that most dentists have to do each day. Too much is taken for granted; everyone is supposed to know, when the fact is they do not. Such methods are of more practical value to the community in the good results following than all the inlay, crown and bridge work. We seem drifting away from the foundation principles and practices of our profession.

Again, the abuse of the dental engine. The cutting away of good teeth, replacing with gold caps fitting the gums perfectly tight, but nothing else; crowning teeth that were better filled. And why? Simply because we own an engine and it is the easiest solution. It is hard work to make the perfect filling, but when thus treated the tooth has very many more years of service to the patient. Gentlemen, I plead for more conservatism, more of the old-fashioned way of treating teeth by filling. A false ambition has overtaken or taken hold of many; but the fact remains. Few men become great surgeons, all may be good doctors; few admirals, all can be able seamen who win battles; few fine workers in porcelain and bridge work, but every dentist should be well grounded in the common work of his calling, doing it uncommonly well, laying a foundation that needs no rebuilding.

Discussion.

Dr. G. A. Maxfield, Holyoke. I want to add a word of commendation on some of the things Dr. Gerrish has given to us. I won't attempt to discuss all the points in the paper; I found it very difficult to keep track of all the good things that were in it.

I wonder, with the enthusiasm that he exhibits in his conservatism, what kind of a man he would be if he were just starting out in the practice of dentistry.

One point he makes in regard to the misuse of the dental engine, and I wish the young men would consider this. I come in contact with so many young men who do everything with the dental engine. They seem hardly to know how to use the excavator. We find a good many people who will not allow the use of the dental engine in the mouth. Recently I was in the office of a dentist in New York who did not have a dental engine, simply because his patients would not allow him to use it. On the other hand, in looking over cabinets of men who use excavators, I am astonished to find the great number of different excavators they use. I have come to the conclusion that the young men do not know how to use the excavator or they would not have so many. In preparing cavities and excavating them, I very seldom have use for more than four excavators and two chisels. I simply want to emphasize the point Dr. Gerrish brought out, that the dental engine is misused, and as a result there is much unnecessary suffering.

Dr. P. A. Charles, Exeter, N. H. Dr. Gerrish works hard and thoroughly and has climbed to the top by his own efforts, having an innate genius for dentistry and mechanics and combining the qualities of character and an up-to-date practitioner that make for success. Some may think he has an exaggerated idea about cleansing teeth. If any of you ever have the opportunity to have him cleanse your teeth, he will disabuse your mind that cleansing teeth is a slight operation, or a fifteen-minute, fifty-cent operation. I wish you could see some fillings he put in twenty-five years or more ago—non-cohesive gold fillings I refer to—absolutely perfect fillings. One could not ask for better ones, and time enhances their beauty and appearance. Where indicated, I believe there are no better fillings possible than non-cohesive ones used under the system as practiced by Dr. Gerrish, and which he has ever been ready to show by clinic and explanation to all who were ready to share the time with him. Ladies and gentlemen, I can wish the dental profession no greater blessing than to have its membership made up of such practitioners as are of the character, ability, and integrity of Dr. Gerrish.

Dr. Gerrish (closing the discussion). In regard to the abuse of the dental engine, I think the great secret in the use of the engine is to revolve it for a second and then withdraw it. You want to surprise the tooth. When you keep a continual pressure on the tooth for a long time heat is generated and this causes pain. When it strikes sensitive dentin, or when in close proximity to the pulp I prefer the excavator, for the reason that it is under better control and will cause less pain.

The subject of Dr. Gerrish's paper was passed, and the next order of business was a paper by Dr. J. E. Power, Providence, R. I., as follows:

The Importance of Early Recognition of Epithelioma.

In this paper it is my object to give the dentist a brief outline of the pathognomonic signs of cancer affecting the oral cavity and its adjacent structures. I shall discuss briefly the early recognition of these conditions, at a time when the malignant tissue may be surgically removed without danger to the life of the individual. As the dentist is the person who sees these affections first, and in all instances long before the patient has any idea that any abnormal conditions are present or developing, we cannot help feeling that the responsibility of arriving at a timely diagnosis falls upon the members of our profession. Because of the number of cases which I have had the good fortune to observe, wherein the time consumed in arriving at a diagnosis was so prolonged and the development of the growth was so considerable that it was beyond the limits where science could be applied in the treatment of the condition, it does seem that with the services of so many skilled pathologists, who are always at our command and whose qualifications in their specialty of medicine and surgery enable them to decide definitely the condition of any growth, that if we do not employ the precepts of this branch of science in the treatment of our patients we are guilty of an error which in many instances is criminal, because such errors may mean death to the individual who may come under our care. In consideration of these statements, which are based on fact, we are bound as individuals and as a profession not to treat too lightly any suspicious indications which may be present in the mouths of our patients, but should regard them seriously and in detail and with the same concern that would characterize our actions if a similar condition were present in our own mouths.

As dentists we should be familiar with the treacherous and apparently innocent development of this form of pathological growth, and voluntarily call the attention of the individual to this condition rather than wait until our advice is solicited and our attention is directed to such conditions by the patient himself, because in many cases the patient's lack of knowledge of his true condition will not lead him to seek any information regarding what he believes to be a simple sore, but what in reality may be a cancer. We know that in the beginning cancer is always a local process which appears as an innocent phlegmon, which gradually but steadily spreads, and if we fail to recognize it in its first stages the surgeon, whether oral or general, will almost invariably see the case only when the disease is too far advanced to permit of a complete removal. In dealing with this subject I will not take your time with the microscopical account of the tissues when affected by this form of disease, but will confine myself to its macroscopical appearance. I will also confine myself to the description of the parts which directly interest us as practitioners of dentistry and specialists of medicine.

The principal signs that may be considered in the examination of a mouth ulcer are first, its situation; whether it is simple or multiple; its size, whether it is disseminated or circumscribed; the character of its edges, whether it has a sharp sinuous, dentated, or undermined border; whether it is indurated or soft; whether it is gray or highly congested, and whether epithelium pearls are present or not. These signs, together with the history and the results of pathological examination, will usually determine the diagnosis.

Epithelioma generally appears after the age of fifty years, rarely before the age of thirty. Epithelioma of the lip generally appears as a simple hyperemia and gradually develops into a hard globular swelling which has the appearance of an undeveloped wart, with a hard base which is inflamed and involves the adjacent tissues within an area of from ¼ of an inch to 1½ inches. In the later stages it may appear as a crack in the lip which has been scabbed over, or as a sore discharging a sticky fluid. The inflammatory condition not only involves the mucous and cutaneous surfaces, but extends into the structures of the lip. It is usually found on either side of the mouth, on the surface where the pipe rests, although it may occur on any part of the lip. Pipe-smoking seems to be one of the accepted etiological factors in producing these conditions. Although it does occur in non-smokers, and occasionally in women, I have never seen cancer of the lip affecting women, and in support of the theory of pipe-smoking being a cause some writers mention the fact that in one instance a woman affected with epithelioma was an habitual smoker of the pipe. Such conclusions cause us to know that it is generally the result of and induced by persistent irritation. The places where it manifests itself, together with other conditions which give rise to it, cause us also to know that by their presence they supply constant mechanical and chemical irritation.

If the growth can be excised before the submaxillary lymphatics become involved there is a good chance that it will not recur more than in other forms of cancer. The knife is the safest and best method for the treatment of this form of disease, and a rule that we should follow is to regard any sores upon the lips of adults who are over forty-five years old as malignant until proved that they are benign. Appropriate treatment should be advised.

The operation if resorted to in time is comparatively simple, and consists of the removal of a V-shaped section which will include the growth; healing is by first intention and generally is complete within a week. Of course, when the disease is so far progressed as to involve other organs, such as the glands, jaws, etc., the operation must be extensive enough to include all the affected tissues, osseous or muscular.

Now, the other pathological condition which presents itself is the syphilitic sore, or chancre, and we should all be able to differentiate between the two conditions. Chancre appears more on the lips of women than of men. In many instances a complete physical examination, together with a detailed history will cause us to be able to recognize chancre, but I have known of cases where such steps would fail to give any positive or reliable information; hence it is necessary to know the physical characteristics of each form of these pathological conditions. First, the lymphatic involvement generally precede the appearance of the sore in syphilis, and it always follows the formation of the primary sore in cancer. Cancer always presents a hard base and the ulcer never heals completely. Chancre seldom if ever has a hard base and will disappear within a few weeks under anti-syphilitic treatment.

Epithelioma of the tongue usually appears on the side of the tongue, although no part is exempt. The anterior portion is more frequently affected than the posterior. It occurs in men more frequently than in women, and between the ages of forty-five and fifty-five years. Barker says it occurs in 46 women to 241 men. Personally I have never seen epithelioma of the tongue affecting women, but have seen several in men. Chemical or mechanical irritation may produce this condition, such as sharp corners of teeth, the accumulation of calculus, ill-fitting plates, caustics, and smoking.

Epithelioma of the tongue is very rapid in its process of destruction; it will appear after the age of forty, and generally within three or six months will have reached a size where operation is contra-indicated. It sometimes appears as a hardened mass, with hardly any inflammation, on the free border of the tongue. It is generally found near a broken tooth, and finally develops into an unhealthy suppurating tissue. At other times it may appear simply as a slowly extending ulcer.

Psoriasis of the tongue generally follows pipe-smoking, and syphilis, and in 80 cases treated by Butler for cancer 16 followed this condition, which proves its predisposition to cancer. Any condition that will produce irritation may be the exciting cause, but it may occur without any pre-existing disease or irritation.

Many cases of epithelioma of the tongue follow leucoplakia, so it is important that this condition be corrected when it first appears. In the last stages of epithelioma of the tongue this organ loses its power of motion, becomes very painful and the glands become affected. When this condition is reached, epithelioma is easily diagnosticated, but it is then too late, as in all such cases there is no chance of recovery, and surgical treatment is contra-indicated. Therefore, we should familiarize ourselves with its early signs, as there are other ulcers which resemble malignancy but are really benign. I feel that a comparative description of such ulcers with their resemblances and differences is perhaps a part of this paper.

Syphilitic ulcer is a condition which is frequently met with and which can be recognized first by the fact that ulceration follows the induration or hardness. In cancer it is just the reverse, the hardness of the tissues follows the ulceration. In cancer we have but one ulcer, in syphilis we may have one or more. Cancer is almost always on the side of the tongue; syphilitic ulcer is on the dorsus of the organ. In the ulcer of syphilis the glands are rarely enlarged; in cancer they are most always enlarged —that is in cases of long standing. Cancer has a very hard edge; syphilitic ulcer has a softer, but very sharp border.

Tubercular ulceration is another condition which we may meet, and in this condition we must rely largely on a correct family and individual history and upon finding the presence of tubercle bacilli. The glands are affected in this condition as they are in cancer, so this condition can be taken only as a corroborative symptom. Tubercular ulcerations are always small. Larger ulcerations therefore would not be tubercular. Tubercular ulceration has a sinuous, irregular, undermined border.

Now we arrive at the *simple ulcer* (which is perhaps the one most commonly met with during our practice) and its recognition while it is a local affection. When such conditions manifest themselves we should look for the irritating object, such as sharp or broken teeth, accumulation of calculus, sharp edge of a plate, etc.

The bases of simple ulcers are seldom indurated, while cancerous ulcerations always have indurated bases. In simple ulcers the degree of infiltration is not noticeable to any extent, in cancer the infiltration of the tissues is very marked. I have within the past few years known of cases of syphilitic ulcer being mistaken for cancer and operation advised; the patient refused, however, and under the care of another practitioner the ulcer disappeared under anti-syphilitic treatment. There is really no excuse for such errors.

Carcinoma or *epithelioma* of the jaws generally appears as an indolent, slowly extending sore, with hardened base and margin, and no evidence of surrounding inflammation being detectable. The growth is of a warty nature. The tissues covering this growth become broken and we have a highly inflamed cauliflower surface, secreting a sticky, viscid fluid. The surface is very painful, as well as the adjacent tissues. Its growth is very rapid, as may be concluded from the following case in which I happened to be one of the consultants: a man sixty-five years of age suffered from a carcinoma of the upper jaw, the side of the tongue, the tonsil, and the cheek. The patient wore an upper denture, and about five months previous to the time of consultation he noticed a small sore at the junction of the hard and soft palates. He gave it home treatment, and during the five or six months the growth included the area just described. In this case, strange as it may seem, the glands were not affected to any extent, especially as one would expect to find in a case with the malignancy involving so much tissue. Of course, in this instance operative treatment was not recommended, and within a short time death will relieve his sufferings. I have seen more of this form of epithelioma in the lower than in the upper jaw and have never seen a case of epithelioma of the jaw in women. In the case of the lower jaw, cancer generally affects the body of the bone, and is usually associated with the simultaneous affection of other parts.

When operation is not resorted to, death generally relieves the sufferings of the individual within a year, or eighteen months, and in a few cases they may live two years. Death is generally due to exhaustion, starvation, and hemorrhage, due to the arteries being in the path of the destructive process.

Although the constitutional symptoms of the disease do not always present themselves in connection with affections of the parts we treat, it is well to know them as a corroborative measure. They are generally preceded by local symptoms when other parts are involved, and consist of a peculiar sallow cachectic look with a yellowish earthy tint of countenance, a careworn, gloomy expression, and anemia with its accompaniments, the degree of these symptoms being in proportion to the stage of the growth as well as the locality. Now, in consideration of the facts that benign and malignant growths resemble each other and that malignancy is produced by chemical and mechanical irritation, we should remove the cause or see that such conditions are prevented from existing.

The practice which I dare say is common among the members both of the dental and medical professions, of applying silver nitrate and other caustics to all sores in the mouths of elderly patients, should be discouraged, for while it will do no good in the treatment of a simple ulcer, it may cause such ulcers to become malignant by the constant irritation produced, and if it is already malignant it does much harm by delaying the date of operation and preventing the patient from knowing his true condition. In all cases the services of a pathologist should be secured to decide positively. Whether or not the surgical treatment of cancer of the mouth and face belongs to the general surgeon or the oral surgeon, I will not discuss, but I agree that its early and correct diagnosis belongs to all branches of medicine, and especially to us who spend our lives in the care and treatment of this one specialty of medicine.

Dr. Power's paper was passed without discussion, and the President announced as the next order of business a paper by Dr. I. J. WETHERBEE, Boston, Mass., as follows:

GOLD AND TIN.

The object of this paper is to present a method of using tin and gold in combination, whereby I believe the valuable qualities of both metals are made use of. Further, some of the features attendant on the use of tin considered by many objectionable are overcome.

In the first place, I wish to say that I consider that the value of tin as a preservative agent of tooth-structure has not been sufficiently appreciated in recent years. I believe that its uses and possibilities have been the most persistently neglected of any of the filling materials made use of by the profession.

It seems to me that only an unfortunate experience could have been responsible for an attack made upon tin during the past year, the paper to which I refer having appeared in the July 1905 issue of the DENTAL COSMOS, wherein tin is accused of being responsible for the formation of stannic acid, with a consequent blackening of tooth-structure and destruction of the dentinal tubuli, ending in devitalization of the pulp. The essayist also spoke of the tin as being drawn away from the cavo-surface angle of the cavity toward the gold, thereby inviting decay in the space thus occasioned.

To the first of these assertions I will say that to prove the formation of stannic acid in any case will require something more logical and convincing than the mere statement without one shred of fact to bolster the contention. As to blackening of tooth-structure as a result of using tin, I will quote from Dr. E. T. Darby, in one of our standard text-books on the subject, wherein he says, "The discoloration is confined to the surface, and the teeth filled with tin are not discolored in consequence of its presence." As to the second assertion, that the tin is drawn away from the cavo-surface angle of the cavity by the gold, I should say that if space were ever found to exist at that point it was primarily due to the fact that the tin had never reached the destination intended by the operator, for once firmly anchored in position no affinity could disturb the tin.

As it is intended to make this paper a short one, I will proceed to a description of the method I employ in combining tin and gold.

The cavity preparation for this method of tin and gold filling requires no pits or grooves, in fact they are a detriment to the successful packing of the tin in place. Although the modes of cavity preparation necessary for soft gold and tin have been associated, yet I assure you there are a great many cases impossible with soft or cohesive foil which are comparatively easy to fill with tin by using a heated point in packing.

First, a mixture of Abbey's soft gold, varying in thickness from four to eight or sixteen layers, is placed in position next to the tooth-cavity wall, which effectually prevents any darkening of tooth-structure; into this is packed the tin which has been formed into a narrow ribbon from a sheet of foil and cut into pieces the sizes of which vary according to the shape and form of the cavity. It is well to have a slight excess of tin before the work of condensing is started. The most important step in the process I consider to be the packing of the tin into place with a point heated as much as the tooth will stand. It seems to me that in any manipulation of tin this is indispensable, and we must remember in this connection that tin is only one-fourth as good a conductor of heat as is gold. I wish to say with all the force of which I am capable, that to my mind tin owes all of its powers of conservation of tooth-structure to the perfect mechanical adaptation of which it is possible, and absolutely none to any chemical reaction which inhibits carious action recurring. The packing should continue until the desired fulness is attained, when a sharp-bladed burnisher is used to cut away the superfluous tin at the margins, also to cut the entire tin surface till it presents a smooth, bright surface. We are now ready to add our cohesive foil to the tin, which is done by beginning with thin pieces of the foil and burnishing them on to the tin surface by means of an ivory burnisher.

The first pieces must be thin in order to cohere to the tin surface. I fold a sheet of cohesive foil twice, making four layers; from this I cut a portion of the end for the first pieces to be used, then continue folding till a narrow ribbon is obtained, after which I continue as in the case of any ordinary burnished gold filling, finishing with disks and strips.

Discussion.

Dr. G. A. Maxfield, Holyoke. I think that many of those who are present will remember the clinics Dr. Shumway gave here. There is one important point that I learned from experience which Dr. Shumway did not emphasize in his clinic, and that was the heating of the tin in order to make the gold adhere. Those who watched Dr. Shumway observed that he warmed his instruments, yet he said nothing about the importance of it when giving the clinic. After seeing how easily he performed the operation, I went home and took up the method. In many operations I had difficulty with the gold not adhering, and could not account for it. I found that when the gold would not adhere, if I heated a large instrument which would cover most of the surface of the tin, and held it there for a few moments, I could then take up a piece of gold and it would adhere and I could go on with the filling.

There is another important point that would be well to bear in mind in following this method, if you wish to hold your patients. I had a patient last Saturday morning, and in examining her mouth I found one of these fillings in the front of her mouth. I asked her how long it had been in, and she said four years. I asked her who put it in. She replied that I had put it in. On looking over my records I found that it was a combination of tin and gold. The tooth looked dark and yet the edges of the filling were perfect, but underneath it looked black. Now, I find in every case that the tin discolors under the gold, and shows through the thin walls of the cavity. I have not observed it so much in bicuspids and molars, but the tin always discolors. So when I use this method I always tell my patients that if they fall into any other dentist's hands and he says anything about decay under the filling, to tell him that it is a tin and gold filling.

Now, in regard to filling lower incisors, you know we have a great deal of trouble if we attempt to put in gold fillings there on account of there being so little dentin between the pulp and the filling. If we attempt to fill these with gold we oftentimes have a dead pulp and possibly an abscess resulting. In these cases tin and gold is an excellent thing, and yet there is this objection, the dark color of the tin showing through. So in these cases I have stopped using tin and gold and use cement and gold instead.

I do not approve of the suggestion that we line the cavity with gold to prevent the discolored tin from showing through the walls of the cavity. We use tin because it is more compatible to the dentin than any other metal. So if we line the cavity with gold we might as well use gold altogether, for there is no benefit in using tin if it does not come in contact with the dentin.

Dr. Wetherbee (closing the discussion). I would like to say that the gold is used in connection with the tin to prevent the tin showing through the tooth-structure. The gold is used to form a matrix around the tin, and this is forced down close to the tooth-structure—that is, soft foil that cannot be annealed by any ordinary process to make it adhere. This is followed all along the walls of the cavity, and the tin is burnished toward the periphery. The soft gold is simply used to prevent the tin from showing through the tooth. With regard to tin discoloring the tooth, it does not discolor it, but simply shows a shadow through the tooth.

I thought this discussion would bring out the adaptation of this method for filling the teeth of young children. In many cases the deciduous teeth exert an influence on the first permanent molar, and when the second deciduous molar is lost, then is the best time to fill the cavities on the first permanent molar, as the entire surface of the molar is exposed to operate on, while if delay is made until the second bicuspid is erupted one must cut down and make a compound cavity on these approximal surfaces.

Dr. Wetherbee's paper was passed, and motion was made and carried to adjourn until 2 o'clock Saturday afternoon.

Third Day—*Afternoon Session.*

The meeting was called to order by the president, Dr. E. O. Kinsman, at 2 o'clock, Saturday afternoon, June 9th.

The first order of business was the reading of a paper by Dr. Eugene S. Talbot, Chicago, Ill., on "Developmental Pathology and Tooth-Decay."

[This paper was printed in the issue of the Cosmos for December 1905, vol. xlvii, page 1432.]

Discussion.

Dr. W. H. Potter, Boston. Dr. Talbot is right in saying that the education of the average dentist does not qualify him to enter into the investigation of scientific subjects. He is trained for practical things in an eminent degree. A distinguished educator recently said that the dental profession seemed most interested in repairing broken-down structures and too little in preventing such conditions. In order to successfully anticipate and ward off pathological conditions the dentist should have a better scientific training; and this training should be acquired by the student largely before he enters the dental school. This means higher preliminary requirements; it is not possible to make up for a lack of preliminary requirements by increasing the terms of the dental schools.

In regard to the causes of dental caries, I believe that the hard resistant foods tend to produce sound teeth, while the soft foods tend to produce unsound teeth. There are systemic causes also at work. The vitality of the individual has much to do with the presence or absence of dental caries. A high degree of vitality resists degenerative processes in the teeth, as in other parts of the body, and a low degree favors degenerative processes.

Dr. C. J. Grieves, Baltimore, Md. I know that the presentation of cases is tiresome, and my excuse for presenting this is that in talking to Dr. Talbot of a case of dental resorption which came under my observation, he said that it would be interesting to cite the case after the reading of the paper. The case was reported before the union meeting of the Maryland, District of Columbia, and the Virginia societies in 1899.

The patient was a healthy young man. By that I mean that I formed my conclusion from the apparent history of the family, which had been under my care for five years prior. The attack began with two pink spots, one in a sound central incisor, without any caries at all, and the other in a central incisor that had been filled by me two years before with gold. These spots increased, and finally the sound central broke off in mastication. The patient would have nothing done until the tooth broke off. I saved the broken-off crown and cut it in sections, and under examination it was found that the dentin had been taken up by resorption without any connection whatever with the oral cavity, but was taken up from the inside of the crown. You will find this case reported, together with the illustrations, in the Dental Cosmos, October 1899. These sections proved that the dentin was actually taken up into the general circulation, by what means the paper states. The point that I want to bring out is this: In the other central where the filling had been placed the dentin had been resorbed from around the filling on the palatal side. Opening into the tooth for the purpose of destroying the pulp, it was found that the dentin had been resorbed from around the filling from the palatal aspect. Now, that shows conclusively the action of the central nervous system in not only laying down but taking up again the dental tissue. I went over the history of the case and watched it carefully for some time. My diagrams showed that there had been little decay in the mouth; but five years after the resorption took place there was decay in abundance, and so I am fixed in my conclusion that the whole denture was damaged. I mention this case because I have a confession to make. I try to do scientific work the best I know how, but my success has been limited—possibly due, as Dr. Potter says, to my lack of preliminary education. However, I went carefully over the case and investigated it, but only within the last year have I discovered the cause from the physician of the family while in my chair. I mentioned the case to him, knowing that he was their family physician, and he told me that the mother had at times been a raving maniac, which fact was carefully covered up by the family, and I had not discovered it. I wish Dr. Talbot would enlighten us a little on that phase of the question, if he will.

Dr. George T. Baker, Boston. I think the reasons for decay of the teeth have been very clearly defined to us, and I agree heartily from my observations with the essayist's conclusions. We notice that in mouths where the jaws are contracted on account of an arrest of the development of the bones, the teeth are prone to decay, and we know that in the mouths of persons who use the toothbrush there is a greater freedom from decay. Cleanliness does away largely with the tendency to decay, but if there is an arrest of development it is going on in spite of us, and it has been said that the conditions are hopeless. If we expect immediate results from education we must be disappointed. But if we take a more extended view of the subject, what is one hundred years, or five hundred years, if we can meet these conditions? Nothing. If we can point the public in the right direction today, the condition is not hopeless.

It occurred to me during the reading of the paper that the tendency of our education is entirely wrong. In our public schools the children are taken, commencing with four and five years, and they are crowded. The brain is overworked at the time when it is developing, at the expense of the jaws and other bones. That is entirely wrong, to my mind. I think the child should receive more physical education and less mental training during the early periods. At present we send children to school and they go there up to the time they are fifteen or sixteen years of age, and then they go to college where they go in for football, baseball, rowing, etc., which give them physical development. I believe that should be reversed; physical development should come first and the mental afterwards. *Mens sana in corpore sano* —a sound mind in a sound body. Let us have the sound body first and the sound mind will follow. I believe the system of education is entirely wrong. I wish the paper could be read by every school committeeman in the United States, as I think it would do a great deal of good.

Dr. W. E. PAGE, Boston. I was talking with a man a number of years ago, who knowing that I was a dentist, brought up the subject of the teeth. He was born in the lumber districts of Maine, had a large frame and a perfectly healthy body, and was apparently about sixty-eight years of age. He had every tooth in his mouth and not a single decayed tooth. He remarked that he had saved his teeth by keeping away from the dentist. He had plenty of good air, plenty of good food, good exercise, and there was the result. I agree with a good deal that Dr. Baker has said in regard to that. I remember about thirty years ago I was filling a tooth for a young lady school teacher. She was a bright young woman, and she asked me why it was that teeth decayed so fast as they do now. "Well," said I, "you have asked me a fair question and I should be able to answer it. I will take the time to deliver you a short lecture, because I believe that knowledge is power, and I want to do all that I can to help other people. We raise our children without regard to the laws of health. Children should have plenty of exercise, sunshine, good food, and plenty of sleep. They should not be allowed to live on hot biscuit and confectionery, which will not produce healthy bodies. Give them whole wheat, as that is the best food you can use if you use the whole of it—every mite of it—which you can do."

This lady married, and a number of years afterward brought her son to me to have his teeth examined—when he was five or six years old. Looking into his mouth I told her I was surprised—that I didn't know when I had seen such a perfect set of deciduous teeth. Every tooth was in good condition—not a cavity in the mouth. She smiled when I remarked on the condition of the teeth, and told me that she had never forgotten that lecture I gave her some years previous—and here was the result. I felt that I was well paid for my time, which at the moment I thought I was wasting, as I well know that most people think of nothing except to be comfortable, amuse themselves, and have a good time. Now, if people would appreciate what the dentist says in regard to rearing children, we would have a better race.

Dr. TALBOT (closing the discussion). I was well pleased with what Dr. Potter said on the subject. The whole subject of the future of the schools of our profession lies, as I said, in two things: the first, an academic degree for entrance into our schools, and the second a better educated corps of teachers. It would be a disadvantage for students with degrees to come in contact with many of the teachers in dental schools. The two must go together in order to make any farther advance in our profession along scientific lines, and therefore the quicker a good foundation for the preliminary education of students, the better. I agree with Dr. Potter in regard to the four years' course. It does not make the student any better. The student comes from the farm and associates with teachers who are not properly educated. The result is that he does not get beyond the mechanical side of his education. I say this because I have been to dental colleges to give lectures. I have lectured in schools, in departments of universities, where the students had no idea except to make a plate or to put in a filling, consequently my lectures were a failure. In other schools there were better results.

In regard to the remarks of the last speaker, I would like to know how the future eating of wheat would affect the fetus. I would like to ask how a child born of defective parents, with unstable nervous systems, where the arrest of development takes place *in utero*—what effect would be produced by wheat food?

There is much to be said on this subject, but time will not permit of a longer discussion. Before closing, however, I would like to recommend a list of books for special reading, as follows:

1. **Minot.** Human Embryology.
2. **John Fiske.** The Destiny of Man.
3. **Arthur Willey.** Amphioxus.
4. **G. Stanley Hall.** Adolescence.
5. **Osborn.** From the Greeks to Darwin.
6. **DeMoor.** Evolution by Atrophy.
7. **Bland-Sutton.** Evolution and Disease.
8. **Roux.** Struggle for Existence Between Organs.
9. **Talbot.** Degeneracy: Its Signs, Causes, and Results.

Dr. **Page.** Evidently Dr. Talbot did not understand me. I think someone asked Oliver Wendell Holmes when was the proper time to begin to train a child, and he said begin with the grandmother. That is my idea—that the food of the mother has much to do with the condition of the child.

On motion the subject was passed.

(To be continued.)

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Monthly Meeting, February 1905.

A regular monthly meeting of the First District Dental Society, State of New York, was held Tuesday evening, February 14, 1905, at the Academy of Medicine, No. 17 West Forty-third street, with the president, Dr. Henry D. Hatch, in the chair.

Incidents of Office Practice.

Dr. **James F. Hasbrouck.** Some time ago a young lady was sent to me suffering excruciating facial neuralgia. She was lacking a third molar and a canine on one side. I referred her to an X-ray specialist, and the radiograph showed an impacted third molar but gave no evidence of the missing canine. After the removal of the third molar the symptoms ceased entirely, and there has been no recurrence.

After the transaction of routine business, Dr. **James E. Power**, of Providence, R. I., was introduced by the president and read a paper on "Oral Surgery" which was illustrated with lantern slides. The paper was as follows:

Oral Surgery.

In making diagnoses of the pathological conditions in the mouth, experience teaches that it is quite often advisable not to follow too closely descriptions as given in books. Such descriptions picture typical cases; but a typical case is only one of many which may fall under the same general principles. In some, one condition is wanting; in others, we find conditions of which the book makes no mention. It devolves upon each one, therefore, rather to apply his principles than to make each case agree with the type. Here, precisely, independent investigation and good judgment must enter in order to insure success.

Whatever may be said of the past, it is not too much to affirm that today the dentist is not a man of merely mechanical skill, whose degree stands only for the extraction of teeth, the insertion of fillings, and the making of artificial dentures. Progress has provided him besides with a thorough scientific knowledge; education has taught him anatomy, the normal condition, pathology, the abnormal condition, and a study of germ life in bacteriology. Generally speaking, he can make much use of these in ordinary practice, but without being thus equipped he certainly should not venture upon the field of dental or oral surgery.

Take, for example, the bones of the head, containing so many canals, foramina, etc., through which pass those highly sensitive structures called nerves. These nerves from one or more common centers radiate to all parts of the body. Their action is multiple—classed, if you will, as direct and reflex. One set at one time influences those adjacent, at another time the effect is manifested in a remote part. Hence it is practically necessary to know their connection and courses throughout the entire body. With such a knowledge, what seemed at first mysterious becomes very simple.

Do not, however, infer that I would wish to usurp the prerogatives of a general practitioner of medicine. It will not be denied to us to bring to bear upon our cases the best knowledge attainable. Suffering humanity will surely accord us the privilege of specializing for its benefit. A degree in medicine, however, is not necessary in order to practice oral surgery, which is positively within the domain of general dentistry. I feel that we as dentists have both the moral and the legal right to practice any surgery of the oral cavity which may come under our observation in the practice of our profession, just as we have the right to administer any and all drugs in the pharmacopeia, either locally or systemically, for the relief of man's suffering. This statement is based upon the fact that oral surgery is one of the subjects upon which we must pass examination both in our respective colleges and before the examining boards in the different states. Is it not unreasonable to suppose that we should be taught subjects which we are not supposed to practice, and to be required to show to the state examiners our qualifications on subjects which we are not allowed to practice?

If we are allowed to make incisions in the oral cavity, why should we be prohibited from making incisions upon the face when the complications that may arise from the injudicious use of the knife—such as the severing of an artery in the oral cavity—are greater and more difficult of correction than those complications which may arise from external incisions. I always operate from the inside of the mouth when it is possible, but this method is followed by me on account of my regard for the patient's after-appearance, rather than from any fear of the complications that may arise from external incisions. In some cases, however, the existing conditions may compel us to make our incisions externally, and in such cases the hair on the face should be shaved and the surface washed thoroughly with soap and warm water. I then wash the surface with sterilized water, and apply 70 per cent. alcohol. This solution is especially adapted for such cases, as it has no irritating effect.

In the making of external incisions, but little is written of the things to be avoided, excepting what is said about cutting the arteries. To my mind more important than this is the danger of cutting Stensen's duct. I will show you a case on the screen later where this duct has been cut, and as a result the saliva instead of taking its natural course comes through the cheek. To say the least, it is a source of great annoyance to this man, as it is necessary for him to tie a sponge under his chin, or bandage his head with a towel, before each meal, in order to catch the saliva which is secreted. During every meal enough saliva is secreted to completely saturate a towel of four thicknesses. If even ordinary care be exercised such accidents can be avoided, as the position of this duct can be easily felt on the inner surface of the cheek, in the region of the two upper molars, and in a great number of instances by holding the cheek away from the teeth the orifice of this duct may be brought within range of vision.

The other things to be avoided are, first, the facial nerve, as it and its branches supply the muscles of expression of the face, and the severing of it may cause paralysis of these muscles. It lies midway between the angle of the jaw and the zygoma, about one inch from the surface. In some cases the branches of this nerve have to be severed, but care should be exercised to prevent it when possible, especially the supra-maxillary branch, which is always found running along with the facial artery. Now, our attention should be directed to the facial and mental arteries. The facial artery can be easily felt on the outside by placing the finger on the angle of the jaw, and drawing it forward until the facial groove on the mandible is reached. The pulsation of the artery at this point can be easily felt, as it passes over this groove on its oblique course across the cheek to the angle of the mouth.

The mental artery and nerve are in the region of the first bicuspid. On the inner surface of the mouth these arteries may be avoided by holding the cheek away from the teeth, and making the incision through the tissues toward the body of the bone. In the case of the mental artery, the first and second bicuspid teeth may be used as surgical landmarks. These, together with a knowledge of the relation of the mental foramen to the mandible, and the good judgment of the operator, may prevent any serious complications. Sometimes, however, even with this knowledge and the average skill, this artery may be cut. This statement is based upon my own experience in accidentally finding the position of this artery with a knife. When this artery is cut through a small opening from the inside of the mouth, such as would be made from the incision into an abscess, the hemostatic forceps is useless, as it is impossible under such circumstances to reach the artery with it. In such cases I pack the opening with sterilized gauze, depending entirely upon this pressure to control the hemorrhage. To prevent secondary hemorrhage I do not remove the packing until after the fourth day. Even at that time great care should be exercised in its removal.

Asepsis is one branch with which the dentist should be familiar, for without a knowledge of this it is impossible to obtain favorable results; without this his operating, whether it be the extraction of a tooth or removal of a tumor, will be defective in one of its most important principles. Of course, we all observe cases which make favorable recoveries where all the laws of aseptic surgery are disregarded, but we also see many more cases which under just the same conditions have terminated fatally. When we consider the vast decrease of mortality since the principle of aseptic and antiseptic surgery have become known, and the great good accomplished by the observance of their laws, it does seem incredible that any scientifically educated man would dare neglect even one step. It is now recognized by all that the principal source of wound infection is through contact with objects that are septic, such as the skin of the patient, the hands of the operator, the instruments used, or the dressings applied. The secret of success in surgical treatment, therefore, is the complete sterilization of these objects.

As you are all familiar with the principle of the different agents used for this purpose, it is unnecessary to say more than that water kept at the boiling-point for fifteen minutes with the addition of sodium bicarbonate is probably one of the best and safest sterilizing agents, and knives and other instruments whose cutting edges would be injured by boiling can be satisfactorily sterilized by placing them in 70 per cent. alcohol and allowing them to remain there for ten or fifteen minutes. They should be, of course, previously cleaned; and while 70 per cent. alcohol is effective, experiments have demonstrated that 95 per cent. alcohol has no effect on dry bacteria. This method is used in many hospitals, and is regarded by those competent to judge as a reliable agent.

Sterilization of the hands of the operator and assistants is the next step of importance. The method commonly used of scrubbing the hands and then immersing them in potassium permanganate, oxalic acid, salt solution, and corrosive sublimate has been proved by the experiments of assistant Professor Harrington of the Harvard Medical School to be ineffective. The best method for sterilization of the hands as well as the field of operation consists in washing them in a solution composed of the following ingredients: Commercial alcohol 94 per cent. 640 cc., hydrochloric acid 60 cc., water 300 cc., corrosive sublimate 0.08 gram. This is known as the Harrington solution No. 9. After the usual scrubbing of the hands with soap and warm water, cutting of the fingernails, etc., the application of this mixture to the hands will destroy bacteria in less than thirty seconds, as shown by a series of experiments conducted by Dr. Harrington. This mixture is non-irritating. One experiment which was performed to prove its effect upon bacteria was that of a young man whose duty consisted in cleaning animal cages. His hands were immersed in this solution from two to five minutes after the ordinary washing without any preliminary care of the nails, and from one hundred plantings only three showed growth.

In the treatment of disease, I feel that the patient should be given all the advantages of science, and there is no greater scientific investigation to which the patient is entitled than that of the pathological examination of growths, and no operation should be attempted unless preceded by such examination, as, no matter how positive we may be, there are cases where the degree of uncertainty will be so great that the success of the operation will depend entirely upon the result of such examination. Of course the dentist is not expected to be a pathologist, but he is at least expected to understand the principles of pathology, to know how to make sections from affected areas for pathological examination, and to be familiar with the great benefits which are derived from the results of such examinations when made by expert pathologists, of whom there are several in every large city. In obtaining specimens for this purpose, great care should be exercised in selecting them from the affected area; that is, to cut deeply, and if it be an osseous growth to take the specimen from as near the center as possible. Unless such care is exercised, you will, after waiting several days, have the pathologist report that the specimen submitted to him was normal, and that he will have to have another specimen in order to supply the desired information.

I generally use a cataract knife or curved scissors for securing specimens from the soft parts, and a nasal curette, such as the one I shall show you, for cutting them from the osseous growths, its spindle-shaped end being especially adapted for drilling into the center of such growths.

If the section can be immediately transferred to the pathologist, it should be placed in a small piece of sterilized gauze which has been previously saturated with 10 per cent. saline solution, but if some time must elapse before it reaches him it should be placed in 95 per cent. alcohol, as in this solution it can be preserved for several days.

Before going into the various pathological conditions, I feel that I should say a word on inflammation, in order to simplify the understanding of some of the cases I will show later. If there were no such thing as inflammation, one-half of the pathological processes would be done away with. It is the succession of changes which take place in living tissues as a result of an injury, provided that the injury is not sufficient to destroy their vitality. These changes always commence with irritation, and if not arrested will terminate in suppuration, or a partial destruction of the part. The four cardinal symptoms which are associated with this condition are pain, redness, heat, and swelling. These conditions are always preceded by irritation, and in the mouth this may be brought about by sudden thermal changes, mechanical injury, the introduction of septic material into the tissues, and malposed teeth. The same steps of inflammation which preceded the formation of an abscess upon a tooth always present themselves in other parts where inflammatory processes are developing.

In the case of an abscessed tooth, owing to the pathological changes which have taken place either within the tooth proper or in the surrounding tissues, the tooth becomes a foreign body; the system tries to expel it; its resistance causes mechanical irritation, and inflammatory processes repeat themselves. In all cases of inflammation I remove the cause, whenever I can, and if the tooth be the cause and extraction be deemed advisable, I operate at once, never waiting for the swelling to subside. In some cases where pus does not follow the extraction of the tooth, I introduce a probe into the socket and explore for it, and when found I syringe the cavity with some warm solution, seldom if ever using peroxid, as I think in a great many cases the latter does more harm than good, and causes much unnecessary pain, by the pressure exerted upon the tissues as a result of the generation and expansion of gases which follow its use.

Most if not all of the surgical cases upon which the dentist is called to operate require the use of an anesthetic either general or local, and there is no more reason for subjecting a patient to pain in these cases than there would be to perform an unclean surgical operation. Perhaps, then, it is within the scope of this paper to say just a word on the administration of these anesthetics. The first step in the administration of a local anesthetic where the hypodermic syringe is used, is the strict observance of asepsis. First, we should use a syringe which has been previously sterilized; next, wash off the surface where the needle is to be inserted. In my own practice, before inserting the needle I always pass it through a Bunsen flame, and then insert it into the tissues, withdraw it a little, and then by gradual pressure upon the piston introduce the fluid until the tissue becomes white. I repeat this process until the whole field is anesthetized, always reintroducing the needle into the whitened area; this and the withdrawal of the point greatly lessen the pain. I always wait from thirty seconds to a minute, and sometimes longer, for anesthesia to be complete before beginning to operate.

For producing local anesthesia I use an all-metal removable piston syringe, pouring the fluid into the barrel, rather than aspirating it through the needle point. Cases have come under my observation where sloughing followed the use of a local anesthetic, and upon questioning the operator I found that though he used sterilized instruments he drew the anesthetic through the needle point from a bottle which was used on several patients. Of course, when he first introduced a sterilized needle into this bottle containing the anesthetic it did not cause any harm, but after introducing it into the tissues of the patient, and then back into the bottle again, as was sometimes necessary, the whole bottle became contaminated. To many of you this may seem unreasonable, but I am conservative when I say that such errors are not confined to any one class of practitioners.

In those cases where general anesthesia is necessary previous preparation of the patient is very important. First, the patient should be instructed to evacuate the contents of the bowels twenty-four hours before the anesthetic is to be administered. Castor oil one-half to one ounce, or calomel one-fifth grain repeated, followed by a dose of magnesium sulfate in solution, is used to accomplish this end. The patient should be instructed to abstain from food at least six hours prior to the taking of the anesthetic. A very important step is the examination of the urine. Of course the dentist is not expected to do this, but he should see that it is done, as such examination will often determine the presence of organic diseases and guide him in the selection of the anesthetic. In some cases, from this step having been overlooked a patient dies. After a general anesthetic has been given, the patient should be kept in bed for at least twenty-four hours, to guard against post-operation or ether pneumonia. On recovering from the effects of a general anesthetic, black coffee administered to the patient in one-half-ounce doses will assist materially in controlling nausea.

Post-extraction hemorrhage is a condition we should all be able to meet, for even though we exclude the extraction of teeth from our practice, there are times when we will be called upon to treat this condition. In the cases under my care I have found the following method effective: First I wash out the cavity with warm saline solution, removing any partially formed clot. Next I pack it with cotton saturated with adrenalin chlorid, muraline (an aluminum preparation), or plaster of Paris; but I feel the principal thing to be done in these cases is, first, the removal of any clot that may have formed, so as to have an absolutely clean surface, and then the firm packing of cotton or gauze into the cavity. Pressure in such cases is much more important than any drug that may be used. In some extreme cases a special appliance may have to be constructed to preserve this pressure. Rest and position are very important. In some extreme cases I have caused the patient to retire with the upper portion of the body elevated.

Another condition that we are often called upon to treat is the pain following extraction, especially of abscessed teeth; and out of a great number of cases I have yet to find one that did not yield to the following treatment in a very short time: First I wash the socket with a warm solution, and then apply a pellet of cotton saturated with a solution composed of equal parts of orthoform, camphor, and 95 per cent. carbolic acid, into the cavity, placing a dry piece of cotton over it to avoid pressure.

The following is another very simple operation which when properly performed will relieve suffering where other treatments fail. In my own practice I have found it especially advisable in the earliest stages of abscess formation where pain is intense, also in those stubborn cases in which, even after the tooth has been properly treated and all septic material removed, applications to the tooth proper or to the tissues surrounding it have had no effect. I have seen cases of this kind accompanied by so much pain that it would seem almost beyond the physical capabilities of the patient to withstand it. This operation consists of first, washing the tissues surrounding the tooth with 70 per cent. alcohol, then applying 95 per cent. carbolic acid, covering an area about the size of a small ball burnisher. Then —after first introducing through the tissues a ball burnisher which has been heated red, to make the opening for the bur, in order to avoid hemorrhage and laceration—with a small round bur, which has been previously sterilized, placed in the engine, drill through the tissues, directing the bur upward and inward toward the apex of the tooth, making a communication with it and the external air. Gently introduce warm water into this opening by means of a syringe, and complete relief from pain will follow. I have operated by this method with some success on the anterior teeth, where broaches have been broken and left in the canals. In cases where the time necessary to accomplish this is uncertain, I operate under local anesthesia. On a molar tooth for instance, where an abscess may be forming, the affected root can be isolated by first drying the gum, and then, by gently pressing the ball of the finger against the alveolar wall, a distinct pulsation can be felt over the infected root.

As there has been so much written on the subject of necrosis, and as the principal form that comes under our observation is that caused by arsenic, due to the leakage of this drug from the cavity of a tooth where it had been placed for the devitalization of the pulp, I will simply describe how in my own practice I avoid certain dangers. First, I never place arsenic in a tooth without first telling patients that the existing condition of the tooth causes me to use one of the most powerful and dangerous of drugs, and that they must present themselves at my office within the next twenty-four hours for examination. Unless they agree to do this I tell them I cannot use it. I always apply tincture of iodin to the tissues around the affected tooth, and wherever it is possible I seal the arsenic into the cavity with cement. In some cases where the cavity extends below the gingival line, and where it is impossible to put on a rubber dam, I use sandarac and cotton, keeping the area dry by the use of cotton rolls, after first applying tincture of iodin to the gum followed by 95 per cent. carbolic acid. I now take a small piece of cotton and place it between the affected tooth and its immediate neighbor. I next take some very thin sandarac varnish, dropping it on this cotton, which is placed in such a position. that it is made to substitute the missing wall of the tooth. Now, with a burnisher which is kept moist with alcohol I shape the cotton, making what might be called a shell contour. I now introduce the arsenic, using a very small amount, firmly believing that the smaller the quantity the more satisfactory the result. Then I apply a small pad of cotton over the arsenic, and with another piece large enough to restore the contour of the tooth I fill the space between the teeth, and saturate this with sandarac from without inward. In some cases where leakage occurs and symptoms of arsenical poisoning present themselves, I remove the affected area with a sharp spoon excavator or a small curette at once. The dental engine is sometimes used for this purpose, but I prefer the hand instruments because they can be guided more accurately. This operation is not very painful. It can be done quickly without an anesthetic if treated in time and it does not require half the skill that is necessary to insert a good gold or amalgam filling. I now apply 95 per cent. carbolic acid, or aromatic sulfuric acid, according to the amount of tissue that has been destroyed. The process of repair is rapid.

Stomatitis is another disease which is of common occurrence. I have seen more of this disease in children than in adults, and to those of you who have seen the suffering of a child affected with this form of inflammation it is needless to speak of the great good we may accomplish by appropriate treatment.

This condition presents itself in the form of a general inflammation of the whole of the oral cavity, affecting principally the tongue, the hard and soft palates, and in some cases the pharynx. Sometimes it appears as whitish streaks or patches. It is also accompanied by considerable heat. The sense of taste is more or less impaired, there is loss of appetite, and as a result the vital resistance of the system is lessened. In advanced stages of this disease, diarrhea does much to weaken the patient, but at other times constipation may exist. The first step in the treatment is to correct either of these conditions. In my own practice I have used fractional doses of calomel 0.1 grain, with sodium bicarbonate 0.8 grains, every three or four hours.

For the local treatment may be used boric acid, 25 grains to the ounce of water, silver nitrate 1 grain to the ounce of water, copper sulfate 5 grains to the ounce of water, or a saturated solution of potassium chlorate. Of these, potassium chlorate has proved itself the most serviceable, at least in my practice. In the case of adults, after attending to the systemic treatment, I prescribe potassium chlorate tablets, instructing the patient to allow them to dissolve slowly in the mouth. In children I have the nurse apply the saturated solution to the affected area with a camel's-hair brush or sterilized gauze swab.

Canker is also treated by local applications, and I have found the full strength aromatic sulfuric acid almost a specific for this condition. I prescribe internally tincture of ferric chlorid gtt. v; potassium chlorate gr. iii; water ½ oz. —every three hours in lemonade.

The tumors most frequently met with in the mouth are the osteoma of the hard palate and the condition known as epulis. The latter is usually found rising between two teeth, generally the bicuspids. At first it is in the form of a deep red globular mass not very sensitive, movable, attached often only by a slender pedicle. It is a condition appearing usually between the ages of twenty and thirty-five, but is sometimes present in old age. At first this growth is small, but the longer it is left undisturbed the more cellular it becomes, and it often acquires a malignant character. Operation is advisable, and when properly performed the prognosis is always favorable. I always thoroughly resect the tumor, never being satisfied with merely removing it through its attachment, as such operations are not complete, and the recurrence of the growth is likely. That portion of the bone immediately beneath the mass should be removed as a measure against its recurrence. The removal of a portion of underlying bone and also the adjacent teeth are very important steps in this operation. This growth sometimes appears in edentulous mouths, in which careful examination should be made for the presence of roots.

An osteoma is a bony tumor which generally appears in the mouth on the hard palate, when it probably does as much toward interfering with the proper adjustment of an artificial denture as anything I know of. Many of these growths pass unnoticed, but in some cases the development has so far progressed that it interferes with the functions and must be surgically removed.

We are all called upon to diagnose diseases of the antrum, even though we may not care to undertake the treatment of such conditions. The antrum becomes affected by disease generally after the twenty-first year of age, and its condition must be determined by the data furnished by the patient and by visual and physical examination. The presence of pus in this cavity manifests itself by a dull heavy pain in the region of the malar bone, usually involving the eye. A foul taste is generally present in the mouth, more noticeable to the patient in the morning before rising. The anatomy of the part combined with the position of the head during sleep will probably explain these phenomena. There is generally an offensive odor, which is, however, noticeable only to the patient. In cases where I suspect the presence of disease, I request the patient to tip the head forward, and the presence of pus will cause them to feel something moving about the eye, accompanied by shooting pains varying in intensity through the frontal bone. I find percussion a very valuable aid, and although transillumination is only corroborative, still it is very important, as by placing the patient in a dark room with an electric light in the mouth a distinct opacity may be seen on the affected side of the head.

I recollect a case where the outer wall of the antrum was expanded by the presence of pus, and where no other symptoms of antrum trouble could be detected, although the case had received no treatment for five or six years. In another case which was referred to me for diagnosis, I found a well-developed case of empyema of the antrum, although but one or two symptoms were present to suggest it. The patient was about twenty-eight years of age. She complained of pain in the head, sudden dizziness upon stooping, and loss of appetite, while the sudden starting or stopping of cars would cause dizziness of such an intensity that she was obliged to walk or to use other conveyances. She had suffered intense pain constantly for eight weeks previous to her visit to me. On the side of the affected antrum all the teeth had been extracted four years previously. Percussion on the malar bone did not cause any pain, neither did she notice any offensive odor in her breath, or foul taste in her mouth on rising in the morning. Percussion on the occipital bone, however, would cause convulsions. She also stated that she had been obliged to lie with her face downward for two weeks previous to the examination, and that if she accidentally changed this position, the pain became unbearable. I examined the patient twice, and finally decided to operate. I drilled through the ridge, making an exploratory opening into the antrum, and was rewarded by finding the sinus filled with pus. Complete relief followed two hours after operating.

Many appliances have been constructed for directing fluids into the antrum, and also for draining the pus contents. Their construction varies greatly, some tubes being no larger than a small silver probe, while others are as large as the circumference of a handpiece. These appliances and drainage tubes are made of metal and vulcanized rubber. In my own practice I have discarded all of the small plugs and tubes. In cases where the teeth are missing I drill through the bone into the antrum in the region of the first molar, making a hole large enough to insert my little finger, never being afraid to make the hole too large. I now make a plug of vulcanized rubber to fit this hole, and hold it in position by clasping it to the adjacent teeth. Where all the teeth are present I make the opening through the canine fossa and retain it by using plain sterilized gauze, with modoformol sprinkled upon it, never using iodoform. In chronic cases, for those which do not yield to the customary treatment, experience has taught me that time is wasted that is spent in syringing, insertion of tubes, etc. I curette all the walls of the antrum, and in many instances I have found necrosis of the floor of the cavity.

After the operation I pack the cavity with sterilized gauze, using for the first two or three days boric acid or any of the many solutions with which you all are familiar. Then I apply silver nitrate, commencing with the one per cent. solution, gradually increasing its strength every forty-eight hours until I have reached the ten per cent. solution. This should be introduced with a swab, as in this way it can be directed more satisfactorily and the patient is thereby prevented from swallowing accidentally any portion of the solution. Neither the face of the patient nor the hands of the operator will be stained as when using a syringe. The swallowing of strong solutions will cause uncontrollable vomiting, hence measures should be taken to prevent it. I have sometimes used tincture of capsicum and iodin, equal parts, instead of the silver preparation, but the silver has always produced better results. The principal object is to keep the antrum clean, free from pus, and to accomplish this I have it syringed every two hours with the ordinary solutions, using the silver preparation twice daily.

Osteoma of the hard palate. H. S., age forty-two years, single, was referred to my office by Dr. C. for diagnosis and treatment. The examination showed the presence of a hard globular swelling on the roof of the mouth, about an inch long, five-eighths of an inch wide, and one-half inch deep. Five years ago the patient had a partial upper vulcanized plate made, and after wearing it about a year a ridge appeared on the roof of the mouth which gradually developed into the present condition. This development was more marked during the last three months. No change in the general health had taken place during this period. I removed a section for pathological examination, and received from the pathologist a negative report.

Operation was advised, and consisted in making an incision from the anterior palatine canal to the soft palate through the center of the mouth. I then resected all the tissues from the roof of the mouth, and passed silk ligatures through the tissues for the purpose of holding them out of the way. Then, by means of the engine, cross-cut burs, bone forceps, curettes, and a large vulcanite bur, I removed the entire tumor, which was very dense and as hard as ivory. After smoothing the surface and washing it thoroughly, I drew the flaps together, holding them in position with six stitches. The temperature was normal twenty-four hours after operation. The operation was performed January 15, 1905.

Necrosis. E. J., age fourteen years, was referred to me by her dentist, December 29, 1904. She presented a well-developed case of necrosis, extending from the central incisor tooth to the first bicuspid. This is a case where perhaps one of the capping preparations may have been the cause of the disturbance.

History: This patient was treated about three months previous to the above date. The dentist stated that the pulp of the central incisor was nearly exposed, and that he had used a capping preparation. Everything had seemed to proceed smoothly until November 29,

1904. At this time she experienced a toothache, and swelling of the face in this region soon followed. Within forty-eight hours the incisor teeth elongated, and the inflammation had spread to the bicuspid teeth on the opposite side.

I extracted the central and the lateral incisor and a malposed canine, and curetted the area.

I have reason to believe that the "capping" probably contained arsenic, as the rapidity with which the destructive process took place was suggestive of this form of necrosis.

External incisions may be concealed at times successfully. A patient presented himself at the hospital clinic some three years ago, with a well-developed case of necrosis with the pus just ready to break externally through the skin.

An operation was advised, and the patient's head was lowered by placing a salt-bag at the back of the neck. An incision was made just large enough to admit the smallest spoon curette. By means of a small periosteal dissector a communication with the abscess was established. I next passed the curette through this opening and scraped the affected bone. The scar is not noticeable.

A change of contour of the outer wall of the antrum is caused by the pressure of pus.

In one of my cases no symptoms of antrum trouble manifested themselves, although the antrum was diseased. The patient was referred to me for advice about the swelling by her dentist, as both she and her friends thought of the possibility of its being of malignant character. I broke through the outer wall, which was very thin, almost like an egg-shell, and opened into the antrum, which I treated during three or four weeks. The patient was forty years of age, the swelling had been present for some years, and the contour of the outer wall kept increasing until it caused a marked facial disfigurement, this being the principal cause of her visit to me. The patient has now entirely recovered.

The case of a child five years of age presented an opening under the left eye caused by pus breaking through the tissues at this point. Examination showed a well-developed case of necrosis.

History: About three months previous to his visit to me, he was troubled by an abscess upon a deciduous molar, accompanied by swelling of the face. He was taken to a dentist, who advised non-interference until the swelling should subside. After three weeks he was taken to a physician, who agreed with the dentist that the extraction of the tooth at such a time would be a very dangerous procedure, but told the child's parents to apply hot flaxseed poultices to the face. This was done, and the result was that the pus broke through the tissues.

Operation consisted in removing the maxilla from the canine to the condyle. Three weeks later another operation was performed to remove a portion of the malar bone. I dressed the wound about fifty-seven times, and about ten ounces of pus were removed at different times, not counting the amount which drained in the intervals between dressings. The patient was discharged as cured about eight weeks after the initial operation.

In an extensive case of arsenical necrosis the patient was under treatment for several weeks, and had a temperature of 103° when I was called to see him. I tried to diagnose this case by a process of elimination, and although his replies were not conclusive, my examination led me to a diagnosis of necrosis. Finally I asked what preparation he had used to clean his teeth with. He replied that he did not use anything, but on returning to the mill where he was employed it was his custom to remove particles of food from between his teeth by the use of colored yarn. I made about eleven distinct tests for arsenic, and nine showed its presence in the yarn. The contour of the face was restored by a lower artificial denture.

The teeth may affect parts remote from the seat of the lesion. A patient, twenty-six years of age, was under treatment four years previous to her visit to me; was treated twice for erysipelas, twice for malaria, and finally underwent two surgical operations for what appeared to be an inflammation of the frontal sinus. The symptoms were constant headache, head seldom clear, difficult respiration; anything white would cause severe pain in the eyes, and stooping would cause sudden dizziness. A carious upper left canine was extracted some four years previously. The tooth was fractured during the operation, and a fragment of root was left within the alveolus.

Operation consisted in cutting through the canine eminence and removing a small fragment of root about the size of a pea. The sinus commenced to heal immediately, the pus stopped flowing, and the headaches ceased.

I was one of the consultants called to see P. L., forty-five years of age. He presented a swelling of the face. The inflammation was so pronounced in this case that it was impossible for him to open his mouth wide enough to insert my little finger. The pain was intense. This man had visited at least six general practitioners who pronounced it cancer, including the consultants that were on the case with myself. This is another case where pathognomonic symptoms were missing. There was no fluctuation, and the presence of pus could not be detected anywhere, but as I had seen cases of necrosis where pus was apparently absent, this together with the history of the case caused me to pronounce it necrosis. I could not convince the other practitioners, who decided to operate. The operation was performed three days later when the ramus of the mandible was found to be the seat of advanced caries. About three ounces of pus were removed. One of the probable reasons why this pus could not be detected was that it was held between the sheath of the masseter muscle and the ramus.

In another case an Italian girl eleven years of age appeared at the hospital clinic with the left side of her face swollen and with a sinus on the same side near the angle of the mandible. The mouth seemed normal, there being no inflammation and no carious teeth, and entire absence of pain on tapping the teeth on the affected side with a metal instrument. All the teeth were present, the first molars were in position, and the second molars had just erupted. I passed a probe into the sinus and directed it inward about an inch and a half. I was not able, however, to communicate with the oral cavity.

History: About two years previous to this time, while living in Italy the patient had a deciduous tooth extracted to relieve a swelling of the face and a persistent toothache. As this end was not accomplished a physician was called, who made an external incision upon the face and relieved the pain.

Within a few days she left Italy and was advised and compelled by a medical inspector to go to one of the Long Island hospitals for operation. She remained in this hospital from January until May, during which period two operations were performed for necrosis, but with no improvement. She was finally brought to Providence and placed in the Rhode Island Hospital, where she remained three months. Two operations were performed at this hospital, making a total of four operations during the eight months of hospital confinement, in the meanwhile the pus exuding from the sinus as in the first stages of the malady. Afterward the patient was treated during a period covering fourteen months by several general practitioners. I advised an operation which consisted in the removal of the tooth with the spiculæ of bone; also in the curetting of the bone, etc. At the end of four days the sinus did not contain any pus, and in twenty-one days the patient was discharged cured, the sinus having entirely healed.

A patient fifty-six years of age was referred to me for treatment four years ago. On examination he presented a sinus on the left side of the face from which pus constantly flowed. The oral cavity was apparently normal: all the teeth had been extracted and artificial dentures substituted for them. On the inside of the mandible, back in the region of the angle, there was a hard globular swelling highly inflamed.

History: About eleven years previous to November, 1899, a small swelling appeared on the left side of the face near the angle of the mandible. There was no pain associated with this swelling, but it increased so during the year that she visited a dentist and under his advice had an apparently normal tooth extracted. The swelling kept increasing, and following the advice of a physician she had three dentists examine her mouth. All agreed that the extraction of all the teeth was the proper procedure to effect a cure. This was finally done, but the swelling kept increasing and she visited several physicians and surgeons who diagnosed the disturbance as an osseous tumor. An operation was accordingly performed, three years previous to her visit to me. The condition remained about the same.

The operation which I performed consisted in making a crucial incision through this globular swelling on the inside, breaking through the bone. By directing a probe through the opening thus made I felt something smooth in the body of the bone. I suggested an impacted third molar. She stated that she remembered distinctly having visited her dentist especially for the purpose of having the third molars extracted. Regardless of her seemingly positive statement I felt quite sure of my diagnosis, and I advised an operation, to which the patient consented. It consisted in dissecting the membrane and exposing the bone from the inside of the mouth. I then chiseled the bone away and exposed the crown of a tooth imbedded in the bone about an eighth of an inch from the surface and lying parallel with the body of the bone. The position of the tooth caused me to fracture it during the operation. I finally removed the whole of the tooth. Another tooth was taken from the opposite side on the same day; this tooth was also buried in the body of the bone and could not be seen, but I thought while the patient was under the ether it might be well to examine, and by operating then avoid future trouble. The time consumed by the operation was forty minutes. The patient was discharged as cured four weeks after the operation.

A patient was referred for advice regarding the extraction of several teeth. She stated that bleeding which would sometimes last for several days followed the slightest operation, and that a hemorrhage had continued for seven days after the last tooth she had had extracted. I felt that if pressure could be maintained the operation would be safe. I therefore constructed an appliance to control hemorrhage.

First, I secured impressions of both jaws, from which I produced models and by adjusting them on the articulator obtained the correct occlusion by the wax method. I then cut the teeth from the model corresponding to the ones I was going to extract, made this appliance in the same manner that a vulcanite plate would be made, and tried it in the mouth, before operating. In extracting I exercised great care, being careful not to fracture the alveolar wall, and operated as if I had intended to replant the teeth. After extracting the second I packed the socket with cotton or gauze saturated with the aluminum preparation described earlier in the paper. After treating each socket in this manner I adjusted the compress holder, first placing strips of gauze between it and the tissues, and holding it in position by a head bandage. Hemorrhage was controlled in three hours.

In the case of a man thirty years of age, with a sinus of the face, the third molar was the cause, although it was a vital tooth, and did not give any signs suggestive of its being the cause of this trouble. The patient had been under treatment by general practitioners for several months, being treated for obstructed sebaceous duct, necrosis, and several other diseases.

In passing a probe into the sinus it stopped opposite the first molar. The operation which I performed consisted in removing the second and third molars, and curetting the bone; this procedure was followed by a complete cure. The patient had been unable to open his mouth for ten days previous to the time of operation.

Discussion.

Dr. G. Lenox Curtis. It seems to me that Dr. Power has endeavored to cover too many subjects in a single paper to do full justice to any one. He has more than outlined the province of a dental surgeon, but in my opinion he has neglected to tell much of what is required in surgery of the mouth. I cannot understand why he underestimates the value of a medical education, for one who practices even the minor oral surgery of which his paper treats, surely needs all the surgical knowledge he can acquire.

It is beyond me to know how a dentist is expected to understand surgery with only a dental training. Listening to surgical lectures, although they be clinical, does not prepare him for this exacting work. The more general surgical knowledge he has the better prepared he is to meet the requirements of a specialist.

How few dental or even medical students have practical surgical experience before graduating. It is clinical practice which prepares a dental student to enter upon a successful career after receiving his diploma. A surgeon must likewise have clinical experience and a full sense of the responsibility implied by surgical interventions. By practice alone one secures ability, and if he be endowed with originality and exactness of detail, in executing his theories he may, after many years of trying experience and phenomenal success, be considered an expert. But experts are not copyists who practice only as taught or who content themselves with telling of the works of others.

From these pictures of diseased faces and from the methods employed in treating them, we may infer that the essayist has gone outside the pale of oral surgery and encroached on the field of general surgery. Oral surgery, as I understand it, is the treatment of diseases of the mouth from within the mouth.

I fail to find, in his report of the cases opened through the face, any mention of removing the cause of the affection.

There is no disease of the mouth or adjacent parts, when the skin is not broken, that should not be and cannot be treated from within the mouth or nose, and without cutting the skin. By this method all the complications of which Dr. Power speaks may be avoided. The general surgeon is slow to appreciate this fact, and to acquire the necessary knowledge which is best gained by dental manual training.

In reporting the case of salivary fistula the essayist happily illustrates the advantage of working from within the mouth. These cases are exceedingly annoying but they are readily corrected by dissecting out the duct and uniting it with the mucous membrane, then closing the external wound. In order to prevent the saliva flowing through the external wound the patient should lie on the opposite side until the wound is healed. I have had patients lie in this position for more than two weeks at a time.

I am surprised that Dr. Power advocates at all external operations. Wounding the facial nerve and artery, or the loss of muscular action, rarely occurs when the operation is from within the mouth. I rarely find it necessary to use an artery forceps or a ligature. Aseptic surgery in the mouth is practically out of the question, owing to glandular secretions. This is largely offset by the jaws and face being richly supplied with blood. Infected instruments and dressings are accountable for sepsis. My experience has been that secretions indigenous to the part operated upon do not infect. This is exemplified in rectal surgery.

I seldom use a knife. Scissors crush the bloodvessels where incisions are made, and by closing them check the flow of blood.

Familiarity with pathological tissues lessens the need for microscopical examinations. When in doubt have an examination made. In malignant cases it is best, as the essayist says, to sacrifice good teeth and surrounding tissue so as to be well beyond the zone of disease. I am treating a case where the heel of the plate had irritated the mucous membrane until an ulcer appeared. This continued for a year or more, with occasional local treatment, when a new plate was made. At this time the upper left tuberosity had disappeared and there was an ulceration the size of a half-dollar, which bled when touched. The gravity of the case was not realized until a general surgeon was consulted who, recognizing it, sent the patient to me. I saw the case two days after the new plate had been adjusted, and recognized it as an epithelioma. The disease had extended to the cheek, soft palate, antrum, and involved two-thirds of the maxilla. The patient is now on the high road to recovery. I showed a similar case to members of this society about three years ago. There has been no return of the trouble and the patient is in excellent health. In these cases speech is interfered with, but it is quite satisfactorily corrected by an artificial denture.

It has been my custom in treating cases of arsenical necrosis to remove the dead tissue and then inject tincture of iodin into the cavity caused by the removal of the bone, and dress the wound with iodoform gauze. This treatment has been most successful. I shall welcome the day when the use of arsenic for devitalizing pulps is abandoned. I believe it to be the cause of much peridental inflammation, even though conservatively used. Its irritating influence is far-reaching.

I do not fully appreciate the advantage of using cauterizing drugs, such as carbolic and sulfuric acids, after the diseased tissue has been removed. Iodin changes the arsenic into an inert substance, and at the same time acts as a counter-irritant and a germicide. Sodium bicarbonate appears to have a rapid and germicidal influence upon cankers and most forms of stomatitis. To some, potassium chlorate is exceedingly irritating, and cases of poisoning have been reported from its use.

In the treatment of epulitic growths, Dr. Power's ground is admirably taken. These cases are often malignant. I am treating such a case now. The dentist had twice removed the growth. It was only with the greatest care that I was able to preserve the upper central incisors. All the bone except on the distal and labial surface was involved. To cauterize these cases is to add fuel to the flame.

For some reason I have found more osteomata in the mandible than in the maxilla. The method of operating for the removal of these growths depends largely upon their size, nature, and location. Even the vitreous variety which the essayist mentions may often be enucleated by burring the soft bone from around it sufficiently to enable one to prize it out. This specimen which I show you and which is as large as the ordinary-sized butternut, was located in the mandible and was removed in that way, the operation being completed in ten minutes. I find that twenty minutes is usually ample time to remove any such growths.

The subject of antrum disease is sufficient to occupy a whole evening, and cannot well be more than touched upon in this discussion. There are many phases of this disease, some of which can only be diagnosed by opening into the antrum. My method is to open at the junction of the malar and maxillary bones, thus avoiding wounding the roots of the teeth, and facilitating treatment and subsequent closing of the wound. Operation at this point does away with the necessity of drainage tubes and prevents the downward flow of the mucus while the wound is healing. When the opening is made in the floor of the antrum, for instance through the tooth-socket, the flow of the mucus is downward and it paralyzes or glues down the ciliary epithelium and prevents its normal action of carrying the mucus out through the natural exit. During treatment the antrum is drained by means of the gauze packing until the membrane is restored and sufficiently recovered to perform its function. Douching with saline solution for a week or two is usually sufficient to secure a healthy condition of the cavity. My average cases, I find, require but six weeks of treatment. The principal cause of this disease is abscessed teeth. Generally these teeth can and should be saved, if only to prevent an opening into the antrum which usually occurs by their extraction. Seldom are these cases successfully treated without operation. Most cases referred to me by dentists have been treated for years by douching.

Occasionally abscesses and cystic tumors are mistaken for antrum disease. In these cases nasal symptoms are wanting, and the antrum is not always diseased. These abscesses or cysts may be of such size as to completely fill the space in the bone which the antrum occupied, the antral sac having been crowded out of its position and lying nearly or completely against the nasal boundary. In treating these cases great care should be exercised not to infect the sac. Dr. Morris not long since called my attention to such a case. I have treated a number of these cases, and have also treated cases where both diseases existed. I have such a case under treatment at present. Here again I use iodoform and iodin, and believe I had best results from them, for reasons as before stated.

I do not appreciate the value of silver nitrate or any cautery following operation, because one more complication is added by reason of the slough caused by the nitrate solution. Cauterizing may be of value when slight inflammatory conditions exist where the bone and mucous membrane are not seriously diseased. In these cases I have found that a tight packing of iodoform gauze which is allowed to remain two or three days, induces sufficient irritation to re-establish normal circulation and secretion.

I must say I cannot conceive the slightest excuse for extracting the teeth of the child whose central incisor was the seat of an abscess. The child was not only deprived of the teeth but the development of the jaw was thereby interfered with. I claim that in even an acute case like this it would have been better to have removed the disease by curretting and packing. I have cases of this nature under my care almost constantly, and many cases of much greater magnitude. I reported a case in a paper read before the American Medical Association in 1897, of a lad thirteen years of age, where the entire bone of the upper jaw was destroyed. There was complete restoration of the jaw, and the usefulness of the teeth was restored with the loss of but one. I am now treating a case in which the necrosis is much more extensive and all of the upper twelve teeth are the seat of abscesses. These I expect will be retained. In the case illustrating how scars may be concealed, the essayist did not tell us the cause of the trouble, but I infer from the symptoms that it was due to an alveolar abscess. If such was the case, alveolotomy, curetting and packing the fistula from within the mouth, would have effected a cure. While in this case the slight scar makes little difference, it would have been inexcusable had the patient been a woman. In the case of the five-year-old child, it seems to me the dentist was wholly at fault, providing he was in position to control the case.

While exceptions have been taken to some of the methods described in the paper, we must allow that Dr. Power cured these cases. It seems to me, however, that in some of the cases more conservative means might have been advantageously adopted.

Dr. Robert T. Morris. Another engagement prevented my being here earlier this evening and hearing the paper and the early part of the discussion; but as I was allowed to see Dr. Power's paper, I made a few notes that were of interest to me at least.

Dr. Power brings up again the question of the necessity of dentists graduating first in medicine before taking up this specialty. It does seem to me that it would add dignity to the dental specialty if it were the custom for dentists first to graduate in medicine, to acquire the general principles governing diseases. One can get at this sort of thing backward, if he pleases; at the same time the comprehension of things is not so apt to be complete. There are men practicing narrow specialties in medicine who have covered the entire field of medicine, until today they find that their whole strength can be concentrated upon one small subject. They need every bit of information that they have been able to acquire in the entire field of medicine, in order to do the best work for their patients and carry out the responsibilities placed in their hands, now that they have become remarkably expert in some one small subject. We need a large condensing glass in order to get rays enough to burn a hole right straight through one subject.

Dr. Power speaks of the danger of cutting arteries. This is one of the bugbears of the medical student, and a great many men go out equipped to practice surgery so fearful of cutting arteries that they never even cut a figure! If arteries are in your way, cut the arteries, and tuck them out of the way for a moment; then go ahead with your work. If the aorta happens to be in the way, that is another matter; but that does not concern dentists. We would cut a large artery today and ligate; but do not let arteries stand in your way at all. It is a bugbear held up by anatomists. They cannot help making pictures of beautiful red arteries and blue veins, because they look so well in plates.

Now about Stensen's duct; Dr. Power mentioned a case where that was cut. We have many Stensen's ducts cut—principally through dark skins—with razors. (Laughter.) It is a very common injury and it is important to know how to repair this injury. In repairing these cases we put a silver probe in and then open down to it. As soon as we open Stensen's duct from the inside we must stretch the duct —that is an important point in technique —otherwise you get a stricture. Paralyze the muscular coat of the duct, otherwise you get a stenosis; then suture the mucosa on to it in funnel form.

The cutting of the nerves is another *bête noire* of the text-books; and yet when we want the nerve-ends to stay apart they will not do it. If we incise at the process of Sphix, and remove one and a half inches of inferior dental nerve for neuralgia, in less than a year the patient will probably come back with a scowl on his face, saying the neuralgia has returned. In case you have an opportunity to examine the nerve, you will find it reunited through an inch and a half of space. Even the sciatic nerve after two years' time and two inches of separation has been known to reunite. It is difficult to keep nerve-ends apart, and we need not fear severing the nerve-ends as the dentist would do it. If it is done accidentally, it is just as well to tell the patient you did it on purpose. We need not fear the cutting of nerves from the standard of fear set down in text-books at any rate.

Germicides for instruments: Dr. Power likes alcohol. It is not a very effective germicide. In rattlesnake bites it is said to be effective if used the right way. An old Virginian told me you could count on it every time for a cure if you used it in the right way—that is, you must have it in you when you are bitten!

A much better germicide is pure carbolic acid. We can keep the carbolic acid in a little flat covered dish and immerse instruments in that for a moment or two and they are absolutely sterile. We pick the instrument out of the pure carbolic, and drop it into alcohol to neutralize the acid and take away the odor.

If you wish to remove rust from instruments, put them into tin chlorid over night. In the morning every bit of rust has disappeared, and they will be found perfectly bright. For deep sterilization, immerse in pure carbolic acid for one minute and they will be absolutely sterile. Pick them out of the solution with a forceps, dip them in alcohol, and they are ready for use; you have destroyed tuberculosis, syphilis, thrush, diphtheria, and any number of the infections that are carried from one patient to another. It is a very certain method.

That leads me to the matter of arsenical necrosis that Dr. Power speaks of. I do not know just what the practice is with dentists today, but I believe that general surgeons have rather passed by the use of arsenic in that way for the reason that it is difficult to limit its action, and one does not know just to what extent it will be active. It depends somewhat on the resistance of the individual. One man's tissues will resist arsenic better than another's. One man's tissues are infected, while another man's tissues are not infected with the same kind of bacteria; so on account of the rather uncertain action of arsenic—I cannot speak authoritatively—but my impression is that we have rather passed by arsenic, and that in its place we might use carbolic acid and alcohol. Carbolic acid will sear as far as you wish it to, and then by introducing alcohol you instantly neutralize it. If an attack of erysipelas begins on the face at any time as the result of a bruise, paint the part with pure carbolic acid, wait thirty seconds until the skin turns white, and then neutralize it with alcohol and the erysipelas will be arrested at once. It is the only means devised for curing erysipelas. It is one of the most valuable resources we have introduced in the field of general surgery. Carbolic acid and alcohol used in this way will probably produce a more limited sort of necrosis than with the cautery.

I never saw the cautery used except among the Indians. I was surprised to see one of my Indians in Labrador bending over another with a red hot wire, putting it into the other's mouth. I did not know what he was doing—whether it was a religious ceremony, or what. I said to him, "What are you doing?"—speaking to him in Chippewa. He answered, "He has a toothache." I asked, "Will that help it?" He said, "Wait and see." In another minute the Indian rose and said his pain was all gone. He had been suffering severely for two or three days. It was an Indian I had in my employ. One would hold the mouth of the Indian open, and the other put that red-hot wire in, and if the pain did not stop at once, they would heat it again and push it in again. It is not very different in its action, either, from carbolic acid neutralized with alcohol, except that the latter is a more delicate way of doing it.

The matter of hand-sterilization is a subject that has been discussed at very great length in the works on surgery. Some of our authorities have urged the use of rubber gloves. I hope the dentists will not take them up. If you wish to use them well, begin with boxing gloves, and after you have cultivated a nice sense of touch with boxing gloves go to rubber gloves; but my advice is, leave them off. Hand-sterilization is a thing that has been developed along scientific lines to a degree beyond its point of usefulness. We do carry bacteria on the hands, but they are pretty easily destroyed—the ones on the surface. If our hands are scrubbed thoroughly in green soap and immersed for one minute in a 1:2000 solution of mercury bichlorid we have destroyed all the bacteria that are proliferating on the surface of the hands.

Hydrogen dioxid causes pain unless free exit be given it. The escaping oxygen will certainly cause a tremendous amount of disturbance unless there be an outlet for it, but where it escapes freely I am sure it would be a very excellent cleansing agent. If we were to carry it through the root-canal into an abscess cavity it would cause a tremendous amount of damage by disturbing the tissues, and give rise to very extensive infection. We can do a great deal of damage with hydrogen dioxid. It is most valuable when properly placed, but it will not do to shut it up in a dark chamber at all.

General anesthetics: We now have come to use in surgery a combination of nitrous oxid and oxygen for many cases. It seems to me that this is something to which the attention of dentists should be directed. We can give it while the patient is in a sitting position, and it is about the only anesthetic that can be given with a fair degree of safety in that position. I have noted the deaths that were reported from anesthetics, and many of them occurred while the patient was sitting in a chair. It is well known that the heart is most apt to fail while the patient is in a sitting position, and the dentist's work is such that he may want to give an anesthetic to the patient who is sitting in the chair. Nitrous oxid and oxygen can be given in that position with safety.

Epulis: Many cases can be made to disappear rapidly by the mother tincture of thuia. Homeopathists have developed the purest form: and the thuia occidentalis injected two or three times a week will very frequently cause the disappearance of epulis in the kind of cases formerly treated surgically. It is a little clinical trick that one picks up and is not in the books. After the epulis has undergone the change to sarcoma—it is one of the tissues that is likely to go over into sarcoma—it is too late to treat as suggested; but before it has become sarcomatous we may use the tincture of thuia with excellent results. I see many cases of epulis during the year, and have been pleased with this method. I do not remember to have operated on a case for three or four years.

Osteoma of the roof of the mouth: The time required for the operation was the point in the paper that attracted my attention—two hours and thirty-five minutes. It seems to me it is better to finish our work rather rapidly, if we can, even at the expense of not doing quite such conscientious work as Dr. Power would do in that length of time. We have found in general surgery where we are doing major operations that it is an important matter to conserve the natural resistance of the patient. You can do almost anything to a man for fifteen minutes; you may explode bombshells under him for fifteen minutes; but he will not do well for an hour of operating—even though you are just cutting his hair! The sympathetic centers are shocked by prolonged anesthesia and by the operation, and we interfere with the protective leucocytosis which is to meet the infection, and in that way recovery is slower, and not quite so thorough as when we operate more quickly and perhaps a little less conscientiously as to detail.

Dr. Sinclair Tousey. I only want to say a few words. One point is in regard to the treatment of persistent hemorrhage after the extraction of teeth. I have been called to a few such cases. I remember one in particular. A lower molar had been extracted and the dentist applied the customary styptic. After the patient reached home the hemorrhage began, and he went back to the dentist, who recognized the fact that it was an unusual case, and put in some preparation of iron and told him if it did not stop he had better call in his physician. The physician was called in and put in more iron. When I went to see him, at the end of about five days, he was lying in bed with hardly a drop of blood in his system, and with a little red stream dripping out of the corner of his mouth and dampening the pillow—the mouth filled with a disgusting black mass of pus and iron. The treatment I advise in such cases has been cleansing the mouth and the socket, and then packing the socket with cotton moistened with Canada balsam. The little pledget of cotton moistened with the Canada balsam is fixed there; it does not require any prolonged pressure. It stops the hemorrhage as if a cork were put into a bottle. In this case it was allowed to remain three or four days until it loosened by natural process, and there was no further trouble.

The early diagnosis of conditions liable to produce necrosis is important. We know in the case of a felon that the very slightest amount of pus forming under the periosteum of the bone, causes necrosis very soon, owing to the tense membrane. The treatment is to make an incision through that membrane and relieve that condition. I personally have been able to assist in the prevention of serious trouble by means of the X ray, which shows the smallest abscess forming about the root of a tooth. In that way we can sometimes locate the trouble before the more serious symptoms have become manifest sufficiently to show which tooth is at the bottom of the trouble.

The X ray is very useful in the diagnosis of those different cysts, and in a certain case lately I found it of value. The patient had an old rotten-looking necrotic appearance of the lower jaw, with a fistula, and the question was whether there were not a couple of roots in there. The X ray showed there were not, and all that was necessary was to make a sufficiently large opening and scrape out the tissue.

I cannot quite agree with some of the speakers about the infectiousness of the secretions of the mouth. The observations I have made have convinced me that the secretions of the mouth are almost innocuous to the tissues of that cavity. Wounds in that region heal very quickly indeed.

Dr. H. W. Gillett. I want to refer to the point made by Dr. Power and Dr. Curtis concerning the result of arsenic. It has been so many years since I had occasion to use it, that I thought all the rest of you had discarded it, too. There is no excuse for the continued use of arsenic, and it has been so long since I have used any that my arsenic bottle is lost and I do not want to find it.

The other point was the reference by Dr. Morris as to the use of 95 per cent. carbolic acid, which I think you will find a safeguard. It has been a comfort to me for many years. I have a receptacle on my cabinet into which every bur I want to use is put with its head well covered with that 95 per cent. carbolic. If that bur must again be used for some other patient, one may feel reasonably confident that it is clean.

Dr. M. L. Rhein. After listening to what Dr. Gillett has just said, I feel like emphasizing very strongly that the day for the use of arsenous oxid in dentistry certainly has passed. With the technique that we have had shown to us in the past few years—the use of the various forms of the cocain salts—there is no moral excuse at the present time for a case of arsenical necrosis.

I disagree with part of the discussion as to operative measures in a case of arsenical necrosis. If there is any form of necrotic condition where operative measures are uncalled for, it is in arsenical necrosis, because operative interference has a tendency to produce further irritation and increase the zone of limitation which it is necessary to establish. We must rely upon nature to set up a sequestrum before we can remove it. Irritation of any kind is not only apt to but will tend to increase the possibility of the necrotic area being very much larger than if it had been undisturbed.

In regard to the advantages *pro* and *con* of external operations and internal operations around the mouth, it seems to me it is like many other subjects—a case of good judgment as to which form to adopt.

What Dr. Tousey has said is unquestionably true, that in a reasonably clean mouth we have very little reason to fear any danger from inoculation of any of the germs that are there. The natural resistance of the parts is sufficient to render them innocuous. It seems begging the question to say that when we operate from without we are departing strictly from the pale of oral surgery. I have taken part in a few operations where it was absolutely imperative to operate from without; it would have been equivalent to a post-mortem necessity if an operation within the mouth had been attempted. That is what I mean when I say we must use our judgment in the individual case. I strongly adhere to the well-defined principle that in ordinary minor cases the operation from within the mouth is the one that is generally followed with success; but it does not follow from that that we do not often have cases where the infection has spread so thoroughly toward the external plane of the periosteum, away from the inside of the mouth, that an internal operation is by far the longest way around to get at the seat of the trouble. It is hard to criticise an operator for any given operation, without seeing the case clinically. It is impossible for us to criticise any of the cases we have seen depicted on the screen tonight, and say that more conservative measures could be used unless we were present at the operation and saw the conditions.

Dr. John I. Hart. The paper and the discussion have been so exhaustive and yet so interesting, that I only wish to call attention to one fact. There are idiosyncrasies manifested by some patients which preclude the possibility of the use of cocain salts, and consequently we are compelled, as much as we deplore it, to use arsenic for devitalizing. I am surprised that an operator who shows such a broad knowledge of technique as Dr. Power should have suggested the covering of the arsenic with cotton saturated with sandarac. I want, before this discussion is closed, to ask Dr. Power if in his judgment it would not be wiser to use the method suggested by Dr. Flagg of Philadelphia—cutting a medicine pocket in the cavity of a broken-down tooth and sealing the arsenic in that portion of the tooth, thus thoroughly protecting the surrounding tissues from the arsenic.

Dr. RHEIN. What does Dr. Hart mean by an idiosyncrasy in regard to the use of cocain? Does he mean the cocain would have a toxic effect?

Dr. HART. The idiosyncrasy I refer to is that the application of cocain in the mouths of two patients in one family invariably produces toxic effects so difficult to overcome that in my judgment it does not seem proper to use it in those cases in that particular family.

Dr. RHEIN. I would like to ask Dr. Hart how he used the cocain.

Dr. HART. The case I refer to was that of a lower first molar with an exposed pulp. The rubber was put over the molar and first bicuspid, because the cavity included both the mesial and the occlusal surfaces, and the attempt was made by pressure anesthesia to anesthetize the pulp and the patient collapsed. Her husband, a physician, subsequently told me that she had manifested similar symptoms when cocain was used, when she did not know for a moment that it was being employed. I can report a similar result in another case.

Dr. RHEIN. I do not think that the case cited by Dr. Hart is a fair case to bring up in a matter of this kind, for the following reason: Personally, I question whether it is possible with cocain pressure to get any constitutional effect in its use on a pulp (unless we have open foramina) in a normally formed tooth, as with the minute openings at the end of the roots I believe it is absolutely impossible. In my experience with cocain, extending over the time that it has been in use, I have used it for a number of patients that were subject to toxic effects—the kind of patients Dr. Hart has spoken of. I have had collapses in my own office—not from its use in the pulp, but when it was introduced within the soft tissues where it would enter into the circulation. With the advantage we have at the present day, due to the little instrument presented by Dr. Tousey a short time ago—the mouth fluoroscope, modeled on the shape of the mouth mirror—it is easy for us to know whether we have roots with open foramina or not. I want to add this statement as the result of my own clinical experience.

Dr. GILLETT. I must say I disagree with Dr. Rhein. I have used cocain for removing pulps for fifteen years or more, and I do not think it is possible to have mild systemic effects. I have had it myself a good many times. That is largely a matter of technique. I have not seen such a case for a number of years, but it will happen if one is not careful with the technique, and the X ray is not needed to find it out.

With regard to Dr. Hart's case, it was in my mind to say before the discussion had gone so far, that I did not think there were any cases where we might not use the cocain satisfactorily. When he explained himself more fully, I am ready to believe that there are occasionally individuals for whom cocain cannot be safely or satisfactorily used, but those cases are so very rare that we can very nearly disregard them. With reasonable precautions, we are not likely to get into trouble. If arsenic is causing any such difficulties today as Dr. Power and Dr. Curtis have mentioned—and they are in a better position to judge concerning that point than any general practitioner of dentistry—it would seem another signboard along the road which I think should be a warning against this dangerous drug.

Dr. POWER. I wish to express my thanks to the gentlemen who have consented to take part in the discussion of my paper. I would like to ask Dr. Hart his objection to applying arsenic with cotton and sandarac, as described in my paper, and I will try to reply to it.

Dr. HART. You suggested where the cavity of decay extended below the gum line, that you would apply cotton saturated with sandarac. I suggested instead of that, that a pocket be cut in the tooth, close to the cavity where the medicine could be sealed in with gutta-percha, eliminating all the danger which might take place if sealed in with cotton and sandarac.

Dr. POWER. Of course, in selected cases that would be a superior method; but there are some cases where the sensitiveness of the tooth would make it almost impossible to cut into the tooth-substance at all. In the way that I apply the arsenic, there is not as much danger as there would be in using gutta-percha, because in such cases the moisture would prevent the gutta-percha from adhering to the sides of the tooth. If, however, I did cut a pocket such as Dr. Hart described, I would use cement instead of gutta-percha.

In reply to Dr. Curtis will say that I do not underestimate the value of a medical education or the value of a medical degree. Dr. Morris says it would add more dignity to the dental profession, but if the dental profession must lean on the shoulders of the medical profession for dignity, such dignity is false and we do not want it. The members of the dental profession are the only ones who can and will place the proper value on their degree. It would perhaps be an excellent thing if we could all have a medical degree and all the other degrees, as no matter what the occupation may be, the broader the education the better adapted is the individual to carry on his work. But such, to many of us, is almost an impossibility. I do not say that a medical degree would make a man less fit to practice oral surgery, but I do say that a medical degree is not necessary. I have not a degree in medicine and I have obtained favorable results where the general practitioners of medicine have failed; and I am not the exception in the profession which I have the honor to represent. If dentists can diagnose cases that have been under treatment for many months, and treat successfully, as I have shown tonight, we are benefiting humanity, and that is all the recognition we care for.

Dr. Curtis said that he was surprised that I should advocate cutting on the outside of the face; I do not advocate making external incisions, but if the occasion presents itself where an external incision should be made, then I say that we are qualified to do so, and should not refer the case to a general practitioner.

The case I showed on the screen, Dr. Curtis said must be a cystic tumor. I say that it was not a cystic tumor, and while I realize that my experience is much more limited than that of Dr. Curtis, I feel also that I am experienced enough to make a correct diagnosis in the case referred to.

In regard to the other case, I think that Dr. Curtis must have misunderstood me. He evidently thought that I extracted the central and lateral teeth. This is not the case and it was not because they were the seat of abscesses. No man could operate upon the case referred to and preserve the teeth. The teeth were elongated due to the destruction of the alveolar process and inflammation of the surrounding parts, and it only required the slightest touch of the curette to cause them to fall. I did not take them out because they were the seat of abscesses, but rather as a step toward the cure of the case.

In regard to Dr. Morris's discussion about cutting arteries, I agree with him that they are painted very vividly in the text-books, and I did not intend to convey the idea that there was any fear of cutting them when necessary. I am not afraid to cut an artery if the artery is in the way. I spoke of inserting the finger in the mouth and drawing the cheek away as a measure against the accidental cutting of the facial and mental arteries. I do not feel that any person is justified in cutting an artery just to demonstrate that he can tie it, and if a man is skilful enough to perform a surgical operation, he is skilful enough to tie an artery.

As to the 70 per cent. alcohol being more effective in destroying bacteria than stronger solutions, I have had no time to make experiments myself; and do not feel that I have the ability or the facilities for making experiments of this kind. But I am willing to accept the results of the experiments of such men as Dr. Harrington of the Harvard Medical School. I name him as my authority in this instance.

Hand-sterilization: I will admit that probably the hands cannot be entirely sterilized. The method I describe is quick. Time is our capital, and anything that economizes our time with good results is of value to us. If a solution can be produced that will destroy bacteria in thirty seconds then that is the solution for us to use.

Dr. Morris suggested that the lengthy operation is a shock to the patient. In the case described, Dr. Morris must realize that a tumor in the roof of the mouth is different from a tumor on other parts of the body, and that it was necessary to remove it in sections, the concavity of the roof of the mouth preventing its removal by cutting around its base, as may be done in other parts of the body. There was no stage of the operation, after I commenced it, where I could leave it. If I tried to postpone its complete removal, I would have had to draw the flaps together, and that would have necessitated drawing them over the ragged edges of bone, and the irritating effect upon the tissues which would have surely followed would have been the source of more danger to the welfare of the individual than the possibility of shock. This patient, however, made a good recovery and her temperature was normal twenty-four hours afterward.

Dr. Morris also spoke of conscientious work as a possible cause for the time consumed in the operation, and I suppose he meant making the edges perfectly smooth. That consumed the least time of the operation; that can be done in three minutes at the longest. The balance of the two hours was consumed in cutting out the tumor in little sections, as described, and preventing any particles from being inspired into the lungs.

Dr. Rhein advises that cases of arsenical necrosis be not surgically interfered with until several days have elapsed and nature given a chance to assist in the recovery. To him I will say that cases of arsenical necrosis should be operated upon immediately, not waiting even twenty-four hours, unless conditions over which we have no control prevent us from treating the case; because even during that period much harm may follow the delay, and in cases where several days are allowed to elapse the condition may reach a stage where scientific treatment is of no avail.

Regarding nature's assistance in such cases, perhaps the words of Professor Welsh will express its mission in such cases clearly: "Nature is neither kind nor grateful; she simply obeys the laws and is very conservative."

A very hearty vote of thanks was given to Dr. Power and to those who discussed the paper.

Adjourned.

B. C. Nash, *Secretary.*

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-seventh Annual Meeting.

(Continued from vol. xlvii, page 1465.)

SECOND DAY—*Morning Session.*

THE meeting was called to order at 11 o'clock Saturday morning, May 13th, by the president, Dr. Wm. Jarvie.

The President announced as the committee provided for in Dr. Perry's resolution, the following: Drs. Wm. Jarvie, chairman, New York; S. G. Perry, New York; R. Ottolengui, New York; R. H. Hofheinz, Rochester; A. R. Cooke, Syracuse.

Dr. JARVIE. That committee desires to report on the name of one gentleman at the present time—a gentleman about whom I think there can be but one opinion—and recommend that he be made a fellow of the society. That gentleman is known the world over for what he has done for promoting scientific research—Dr. G. V. Black, of Chicago, Ill. This is the only name the committee will report this year on account of wanting more time to consider the subject. The committee ask to be empowered to carry out the provision of the by-laws—to have the medals made, etc.

Dr. BURKHART. I move that Dr. Jarvie's committee be authorized to carry into effect the suggestions offered by Dr. Jarvie. Motion carried.

Dr. Burkhart, chairman of the Business Committee, reported that the first paper of the morning session would be by Dr. A. H. PECK of Chicago, on "Ethics," to be read by Dr. C. S. Butler.

After the reading and discussion of Dr. Peck's paper, Dr. Butler read the report of the Executive Council. He also read a letter from the promoters of the Portland Dental Congress.

The report of the Executive Council was on motion adopted.

The next order of business was the report of the Committee on Practice, by Dr. A. L. SWIFT, New York, as follows:

REPORT OF THE COMMITTEE ON PRACTICE.

In reviewing the prolific literature of the year your committee was so impressed with the utter futility of attempting in this short report even to touch upon the numerous important methods of practice which should be considered, that he must be content, as you undoubtedly will be, to select only a few subjects for your consideration.

Porcelain work has been the all-absorbing topic of the year; its scope and influence on operative dentistry have been weighed and discussed throughout the land, and it has been universally accepted as a potent factor in operative dentistry. Porcelain undoubtedly is an ideal material as a restorer of lost tooth-structure, both as to harmony and compatibility. Its range of application, of course, is limited largely by the limitations of the operator, whose technique and manipulation must be positive if definite results are to be obtained. Porcelain workers are still lamenting the fact that no translucent cement has as yet come to light. The past year's experience has worked a decided improvement as to results and conclusions, and the general practice in porcelain has been markedly increased with undoubtedly increasing efficiency, as our technique and experimental knowledge have progressed. The consensus of opinion, however, points to a positive undercurrent suggesting conservatism as to the range of application, which your committee most positively recommends. Nothing succeeds like success, and failures, through whatever cause—lack of judgment, personal inability, indifference to minor details, the biting off of more than one can chew, or what not—have deprived humanity of untold blessings all through the ages, until conservatism, ability, experience, and devotion to detail have reclaimed that which was lost.

Dr. Jenkins' prosthetic porcelain has received universal indorsement. Fusing at 75° C. below the melting-point of gold, and flowing readily into the finest crevices, it attaches itself to teeth of varied manufacture, uniting in a solid mass which is exceedingly tough and strong, with a glaze so hard that it withstands mechanical abrasion. With its wide range of application to dentures, bridges, and crowns, this material unfolds a great future for dental prosthesis.

The establishment and maintenance of prophylaxis is no new doctrine, but the recent stimulus received through the writings and acknowledged results of Dr. D. D. Smith has set in motion a wave of earnest interest which has spread throughout our ranks and has left its mark all along the line. May this wave increase in force and volume and continue to spread until its influence shall be felt by every practitioner throughout the land!

Your committee considers oral prophylaxis a most vital subject. It has been a hobby of the writer for many years and he cannot too forcibly urge its importance. To establish and maintain the highest possible standard of prophylaxis should be the aim of every conscientious and truly progressive practitioner. Tiresome and tedious to the extreme—as this work undoubtedly is—requiring the most skilful manipulation, the most careful, painstaking, thoroughly conscientious, and constant effort one is capable of lavishing upon it—yet in the experience of the writer, this labor has yielded the most positive and gratifying results he has ever accomplished.

Prophylaxis and its teachings should begin at the earliest possible age, and instruction as to the proper use of the tooth-brush, dentifrices, mouth-washes, etc., should be the first duty of the dentist to his patient, young or old, after the relief of positive suffering.

The ignorance displayed by intelligent people regarding the proper use of the tooth-brush is astonishing, and the truth of the old adage, "It is hard to teach an old dog new tricks," is evidenced by the fact that patients will so often, especially when preoccupied or in haste, go back to the method of brushing practiced since childhood. Depending, as we do, so much upon the co-operation of our patients, our teachings should begin early, and the importance of frequent and proper brushing of the teeth and gums is so great that it should, if needed, be constantly impressed upon every patient.

The education of patients as to the length of interval between visits in my practice, I find in looking over my records, has been slow but sure, as it is bound to be if one takes pains to make the results convincing. What can be accomplished by prophylaxis in the prevention, arrest, and cure of pyorrhea has been demonstrated beyond question.

Pyorrhea alveolaris with all its symptoms is still increasing, however, and in my experience is manifesting itself very much earlier in life than it did twenty years ago; this fact has forced itself upon my notice, fully developed cases appearing in the mouths of children.

It is claimed by many that pyorrhea is the result of purely local causes. Should this increased and earlier manifestation be construed as being entirely due to purely local causes? I firmly believe that malnutrition and faulty circulation as the result of functional derangement and the uric acid and gouty diathesis must be reckoned with as predisposing causes. But aside from all questions as to the etiology of pyorrhea, whether purely local or largely influenced by constitutional conditions, surely our positive duty as practitioners stands out as clearly as the noonday sun. We must ever strive to secure the highest possible standard of prophylaxis, both educationally and practically, particularly with the young, and bend every effort to prevent the dissolution of continuity of the pericementum surrounding the cervical margins of the teeth, thus preventing the opening of a field for the activity of the micro-organisms.

Experiments with the X ray, high-frequency currents, the ultra-violet ray, and radium in oral therapeutics have been reported, claiming good results in many cases. The apparently successful use of radium in the treatment of a bony tumor in the lower maxilla of a patient eighty-two years of age has recently been brought to the notice of your committee. Although sufficient time has not elapsed to deduce positive conclusions, the present improvement is remarkable.

Many favorable reports have been received by your committee from those who have used Dr. Myers' obtunder. The technique of the use of this instrument, which you are probably familiar with, consists in drilling a small cavity in the sound dentin sufficient to admit the introduction of the nozzle of the instrument either in the cavity or as near it as possible; the anesthetic is then forced through the tubuli of the dentin into the pulp-cavity by means of the instrument. It is claimed that perfect anesthesia can thus be obtained in the most sensitive cavities, in grinding for crown and bridge work, and in pulp-extirpation.

Some considerable difficulty has been experienced by many who have used this instrument, owing to the peculiar shape of the handles, which not being easily grasped, cramp the hand of the operator and interfere with the manipulation.

Anesthesia can undoubtedly be produced by this method when properly manipulated, but the question as to whether deleterious results to the pulp follow its use can only be determined by the lapse of time and by careful investigation. Your committee recommends that this method be practiced very conservatively until reasonably positive as to its after-effects upon the pulp. If the method proves successful, a modification of this instrument to suit all practical needs can readily be accomplished.

The practice of pressure anesthesia for the extirpation of the living pulp has become so general that the use of arsenic for this purpose is regarded by many as bordering on malpractice, and your committee believes that a larger acquaintance with pressure anesthesia will relegate the use of arsenic to a very limited field.

Discussion.

Dr. B. C. Nash, New York. The carefully prepared report which Dr. Swift has presented indicates the principles of a safe and conservative practice. His ideas on the subject of porcelain inlays cover the ground and are to be commended. The ideal work of this class which it has been my privilege to see conclusively proves its value. The only question for argument is that of method, which has been well provided for in the clinics at this meeting.

The subject of prophylaxis is necessarily wedded to pyorrhea alveolaris, a subject which seems to bob up at every convention. I cannot remember to have seen a pronounced case of pyorrhea in childhood. At that period the conditions we have to deal with are usually green stain or yellowish accumulations with little or no salivary calculus. These are readily disposed of by means of iodin and thorough polishing. In addition to this we occasionally see a condition of acid erosion at the necks of the teeth, showing opaque streaks or spots. If the lesson is heeded, which we strive to impress by precept and example, much good is accomplished, but unfortunately it is only after repeated efforts on our part, and frequently after the lapse of several years that we see satisfactory results. It is in this respect that parents, as well as children, need education, for the care of the teeth is often relegated to the nurse, and only when alarming conditions develop do they awaken to a sense of duty.

Dr. Swift urges the establishment of a standard of prophylaxis at an early age. With this we must all agree, for it is no time to talk of curing pyorrhea when the disease has existed for ten years or more with all the teeth affected and some in a hopeless condition. In one day recently I had three cases of pyorrhea in anemic subjects, in all of which the disease was progressive and where from time to time the teeth must inevitably be lost. The symptoms were remarkably similar: gums of varying color from a dull pink to a dark red; teeth separated and out of line, some of them loosened, with pockets extending almost their entire length, and pus exuding from nearly all. The tissues were boggy and would bleed on the slightest touch. The breath had the characteristic odor of the disease. None of these cases were in neglected mouths. In one case the patient said she was always well, never had an ailment, and yet on questioning her she remembered years ago to have had a hemorrhage as the result of a playful frolic. I extracted for her a lower second molar which was so loose that I could have removed it with thumb and finger if I could have grasped it. The pain was trifling, but the patient fainted on my hands and it was fully ten minutes before she recovered. The tooth showed deposits of serumal tartar which no instrumentation could have removed, nor the pericementum revived by any treatment. This is a type of pyorrhea which curatives will not cure nor palliatives palliate. It is the part of honesty to so pronounce it, and to hold out as false hopes that repeated treatments will benefit. The best we can do is to devote our attention to the teeth remaining, and with the co-operation of the patient and medical aid, to restore defective function. If the patient will return for treatment at reasonable intervals the disease may be held in abeyance and only an occasional tooth be lost.

I regard pressure anesthesia as one of the greatest helps that has come to us in the past twenty years, for by it we are enabled to control pain and to make positive progress in the management of pulp-exposures, whereas by the use of arsenic the results are often uncertain and treatment prolonged. The hemorrhage of the pulp is not readily controlled, and it is difficult to remove the pulp intact. It is therefore not advisable to fill the root when this condition obtains, but after applying dressing with oil of cloves or carbolic acid, defer the filling to a subsequent sitting. It may even then be necessary to repeat the pressure on account of the pain, which may be almost as acute as at first. But by persistence this may be overcome. In some cases where I have completed the operation at one sitting there has been a resultant soreness which, however, yielded to counter irritants, and I have not had occasion to remove the fillings.

I would not condemn the use of arsenic entirely, for while I prefer the pressure method, the location of cavities or some other circumstance might decide in its favor. The danger of leakage being recognized, careful management reduces it to a minimum.

It would be impossible to present in a reasonable length of time a report comprising all advancements in dentistry since the date of our last meeting, but in the report just submitted those things which are of the most vital importance to the dentist and to his patient have been mentioned.

For instance, how rife with importance is each little new invention, or new method, which goes toward perfecting the use of porcelain in the various branches of dentistry. The scope of porcelain is widening every year, and it is certainly safe to say that with our constantly increasing knowledge and experience in the use of this material, the display of gold and other unsightly materials in the mouth is yearly growing less and less. What an advance this is, and think what it means to our patients!

The remarks of the committee on the subject of oral prophylaxis are full of vital interest and show an earnestness of feeling on the part of the essayist in regard to the subject that I believe is reflected in the mind of every conscientious practitioner of today.

The theory of oral prophylaxis is like many another theory in that it has had to wait for general recognition, even though the truth underlying it has always been positively known. The truth underlying this particular theory is that absolute cleanliness in the oral cavity is better than slovenly neglect. You will agree with me, I am sure, that this fact was the same a century ago as it is today, but it remained for a few men to take up this old truth, and by devoting special effort and study to it, and by applying it conscientiously in their practices, they have evolved a "system," so-called—a system of oral prophylaxis—and the impetus this old truth has in this way received is being felt throughout the ranks of the profession.

Our committee speaks in a discouraging way of the increasing pyorrheal tendency: he has observed the progress of this tendency for twenty years, according to his own confession, and in the matter of time he has the advantage of me, but only recently I had recorded the thought that I was dealing nowadays with fewer cases of virulent pyorrhea than I had to deal with four or five years ago, and I entertain the fond hope that our increasing knowledge of the value of systematic oral prophylaxis as constantly maintained by the patient, periodically assisted by the dentist, will help to reduce the tendency to this pernicious disease in the coming generation.

In reference to the use of cocain as an obtundent in sensitive cavities, and as an anesthetic for the extirpation of the pulp, there is much to be said—much more, in fact, than any one man can say, for I find that nearly every operator has ideas in regard to this drug that are radically different from those of his neighbor.

Speaking from my own experience, however, I am constrained to say that the system of removing live pulps with cocain under pressure has been one of the most valuable helps to me in my daily practice. Under certain conditions the anesthesia is obtained with some difficulty, and sometimes in fungoid pulps I have failed to produce anesthesia with cocain under pressure, and have been obliged to use other means; but in the average case it works like a charm, and is, I believe, universally used.

In spite of the foregoing remarks in regard to cocain, however, I do not think that the use of arsenous acid is any more akin to malpractice today than it was ten years ago, and judiciously used it is a valuable agent.

Dr. W. W. Smith, Rochester. It is a lamentable fact that the profession during the last year, as in years past, has been more interested in mechanics and the restoration of diseased and lost dental organs than in prophylactic measures. For this reason Dr. Swift could not do otherwise than give porcelain first place in this report. I am looking forward to the time when this order will be reversed and prophylaxis will be the foremost subject for discussion and be considered the most important part of our practice.

The present status of porcelain has been well given in the report. It has come generally to be admitted that porcelain has come to stay, and the dentist who has not allowed his enthusiasm to go beyond his skill and judgment is gradually growing into the belief that the limitations as to its use as a filling material are bounded only by his own limitations of skill and the ability and willingness of his patients to pay for such services. I can hardly agree with the report that Dr. Jenkins' low-fusing body meets with general approval as a material to fuse on the teeth we obtain from manufacturers. I should say that a body that fuses at a temperature nearer the fusing-point of those teeth would be a much safer body to use.

I desire to emphasize all in the report in regard to prophylaxis. There is certainly a growing interest in the subject. The results that have been obtained by thorough and skilful prophylactic treatment in exciting vital energy in the teeth and surroundings and thus rendering them in some cases immune to decay and disease is an inspiration and should command our best efforts. I trust that another year will produce a greatly increased number of enthusiastic workers in these lines.

I agree most heartily with what Dr. Swift has reported in regard to pressure anesthesia.

Dr. A. H. Merritt, New York. It seems almost impossible, in fact I think it is universally considered impossible to obtain anesthesia with cocain under pressure in the presence of pulp-stones. During the past year I have used pressure anesthesia considerably, and it has been my experience that in those cases where pulp-stones are present it is impossible to obtain anesthesia in this way, and it would seem that the number of cases met with of this kind will always make a place for arsenic in our practice. This may not be the ideal means of devitalizing these teeth, but it will accomplish it, though much more time will be required.

Dr. HOFHEINZ. I do not intend to discuss the paper, and only want to mention one point in regard to pressure anesthesia in cases of pulp-stones. A great many instances are on record where arsenic is supposed not to have acted upon the pulp which was due entirely to the fact that there were pulp-stones present. The arsenic will only penetrate to the pulp-stones and destroy the pulp to that point, and anything beyond the pulp-stone may retain its vitality. I believe there is nothing better than cataphoresis to destroy pulps with these calcareous deposits.

Dr. SAMUEL GOLDSMITH, New York. I wish to commend the report. With reference to the methods of anesthesia mentioned therein, I practice them today and have been practicing them for some time. I use cocain pressure anesthesia in the great majority of cases, but I still use arsenic in a small minority. I find it necessary at times, and I do not think it malpractice to do so.

Dr. F. L. FOSSUME, New York. In connection with the discussion on sensitive dentin, I would like to speak of a method that I have used with great success. In removing the sensitiveness at the necks of teeth I always apply the rubber dam, wash the sensitive parts with a saturated solution of sodium bicarbonate, then dry the part with a small pellet of cotton and apply a 40 per cent. solution of formalin, rubbing it in with an orange-wood stick. A minute or two is usually sufficient to overcome the sensitiveness. In a cavity where the dentin is hard and sensitive, or where it is certain that the pulp is not exposed, a 20 per cent. solution of formaldehyd may be sealed, with almost certain successful results. A few crystals of cocain may be added if the tooth aches.

I have several objections to the Myers instrument. A decayed tooth, as we all know, is deeply infected, and the driving of any substance by the use of such an instrument through the infected area must drive some of the organism into the substance of the pulp. The physiological function of the pulp is also necessarily somewhat disturbed by the mechanical pressure, and it is fair to assume that the reaction will be a congestion which may end in strangulation and death of the pulp. In cases where the pulp is to be removed these objections do not obtain, and these are the only cases where I have tried it, but in every case the patient complained of a feeling which they characterized as "explosive." So severe and painful has been this pressure that I have not found the use of this instrument satisfactory in a single case.

Dr. W. W. SMITH. With regard to the handling of the Myers instrument being awkward, it seems to me that it is not awkward if the barrel is not filled full, and of course it is not necessary to fill the barrel full, so that the syringe handles should not go far enough apart to render the handling of the instrument awkward. Even then there are other instruments that obviate this difficulty.

Dr. SWIFT (closing the discussion). There is very little to say in closing, but there are a few points I should like to refer to. Dr. Nash said in his discussion that he had never seen a case of pyorrhea in the mouth of a child. I have repeatedly seen such cases, not where pyorrhea had spread all about the mouth, but where one or two and sometimes several teeth were involved.

Dr. HOFHEINZ. What age?

Dr. SWIFT. The youngest case I remember was eight years of age. I am now treating a case in the mouth of a girl ten years of age. Her father and mother, two older sisters, and an elder brother are under my care and all have typical cases of pyorrhea. The brother I have only seen once; he has been living in the South, remote from any dentist, and his teeth have received no attention for two and a half years. I found that every tooth in his mouth was involved and he had one of the worst cases of pyorrhea I have ever seen in the mouth of a cultured person. Nearly all of his teeth had been beautifully filled with gold and showed early and conscientious care in that respect, but his dentist had never mentioned that he had even a tendency to pyorrhea.

Dr. BROOMELL. What nationality?

Dr. SWIFT. American. He is a member of a highly cultured and very wealthy family who have been under the constant care of several well-known dentists all their lives, as the workmanship in their mouths show. Still little or no attention has been given to the pyorrheal condition which as I said before is present in every one of their mouths. I lay special emphasis upon the cases of this entire family (and I could mention many other parallel cases where this predisposition runs through families) because, as stated in my report, it is claimed by many that pyorrhea is occasioned by purely local causes and that hereditary predisposition, lack of perfect nutrition, and faulty metabolism are not exciting causes. The case of the girl ten years of age referred to is not a bad case. Pyorrhea has affected the two lower incisors, and I found serumal deposits about the deciduous molars, and the gums all about the mouth were congested, soft and spongy. I have mentioned only this case, but I surely am not exaggerating when I state that I have seen seven or eight similar cases in the past few years, which proves to me that pyorrhea does appear earlier than in adult life.

Dr. Tracy speaks of the increasing prevalence of pyorrhea as mentioned in the report. Perhaps it has been my misfortune, or the misfortune of my patients, but I have seen a great many cases of pyorrhea in the last twenty years or more, and perhaps my opinion for that reason may be slightly biased. I would say, however, that in my own practice where the patients have been receiving constant prophylactic treatment, that is not the class referred to as of increasing prevalence. I have people coming to me every day—cultured people, people who have been going to the best dentists—whose mouths cause me to believe that this work is not being done by many of our best men as it should be.

With regard to Dr. Smith's question as to why I did not put prophylaxis first, I did this because porcelain is the all-absorbing topic at present, and not because porcelain was of the most importance. I would like to emphasize with all the force possible the importance of prophylactic work, because I feel that very few men of my own age have spent the amount of time and study upon this disease in all its phases that I have. I know it is increasing in prevalence and appearing in mouths at an earlier age than it did twenty years ago, and I am confident that there is something more than local causes behind this disease, and if we are going to look only for local causes we are not on the right track. I know local treatment is the essential treatment, but would it be amiss to suggest that there is possibly a constitutional cause? A lowered vitality which manifests itself simply in the mouth in many cases? My experience is that some of the most advanced cases of pyorrhea occur in the moutns of people of apparently strong constitutions. My theory is that in these we may suspect hereditary predisposition, faulty metabolism, or a lowered vitality which seems to manifest itself at this particular point. In this connection we may consider the socket of the tooth in the nature of a joint. It is not a true joint, but it is pretty near to a joint, and we know that calcareous deposits do appear in the joints from constitutional causes and we know calcareous deposits do appear in the mouth around the teeth.

Dr. McDONAGH, Toronto, Canada. In the young patients you speak of, are they not patients whose mouths have not been well cared for?

Dr. SWIFT. In the few cases that I

have seen in the mouths of children, they have been in almost all instances cases which had received good care as to fillings, where the teeth were well cared for on the outside, but on the inside of the teeth it looked as though a tooth-brush had never been used.

With reference to the question of malpractice in using arsenic, if you will reread that portion of the paper, you will see that I made no such statement. I said the use of pressure anesthesia was meeting with such general success that many considered it bordering on malpractice to use arsenic. While I admit there are cases where arsenic should be used, I reiterate my statement that the more we have to do with pressure anesthesia the more positively will arsenic be relegated to a small and limited field.

On motion the report of the Committee on Practice was accepted, and the subject passed.

The next order of business was the reading of the Report of the Correspondent by Dr. Ellison Hillyer, Brooklyn, as follows:

Correspondent's Report.

Every practitioner of our profession who is conscientiously alert to the needs of the times and the comfort of his patients is eager to avail himself of every means possible to make his operations satisfactory both to himself and to his patients. His own satisfaction is attained first by thorough work, which usually carries with it lasting results. His patient's satisfaction is gained by the same means; but if "in the gaining of the end" the processes are deprived of pain, then the operator is "lauded to the skies" and the dread of further operations grows less and less.

This perfectly legitimate aim, however, has been seized upon by the unscrupulous practitioner, and all sorts of nostrums and questionable methods are being used empirically by such practitioners upon patients who know nothing of the means used, and who are perfectly satisfied to be relieved from any present pain, careless of future results, with the motto "Sufficient unto the day is the evil thereof"—hence the dental parlor with its lurid presence and odious renown.

I am influenced by both phases of this question in making this the subject of this year's correspondence: on the one side the conscientious practitioner anxious to do the right thing and desirous of knowing and avoiding dangerous methods; on the other side the unscrupulous dentist knowing little and caring less about safe methods or evil after-results.

Desiring to place before you the opinions of men all over this country upon the methods used, I sent out the following questions to several men in various sections:

Dear Doctor,—In order to place before the members of our society, at the coming meeting, the consensus of the best opinions to date upon the subject of the desensitization of dentin, will you kindly reply to the following questions?

Your answers will be embodied in my report.

(1) What method do you use to obtund sensitive dentin?

(2) Are you using any of the various new syringes intended for the above-stated purpose, and if so, with what results?

(3) How do you explain the phenomenon of thorough desensitization of the dentin?

(4) In your opinion, does the cocain solution absolutely enter the pulp, and if so, do you anticipate any evil results therefrom?

(5) How does the action of cocain introduced in this manner compare with the action of cocain used by cataphoresis?

Thanking you for your compliance, I remain

Very truly yours,
Ellison Hillyer, Correspondent.

The following replies were received:

Dr. C. N. Johnson, Chicago:

I use different methods of obtunding sensitive dentin, according to the indications present, but I find no method infallible. Neither do I find the factor of sensitive dentin such a bugbear as it would seem to be to many in the profession. It is true that I have many cases of exceedingly sensitive teeth, but these are frequently the cases where the pressure method and the syringe method are wholly impracticable. The detailed management of these cases would require a paper in itself.

I use desiccation, preceded by 95 per cent. carbolic acid in cases where the desiccation causes pain. I also use carbolic acid on a pellet of cotton, driving the agent into the dentin with a heated instrument applied to the cotton, and this followed by dryness. I use the Knowles obtunder with good effect in some cases, but most of all I use keenly sharp instruments, with the utmost delicacy of touch, and this latter, though very old and very hackneyed, is after all the best and most logical solution of the problem. If the profession generally would develop sufficient adroitness in the manipulation of instruments we would not hear so much about the terrors of sensitive dentin.

Dr. R. Ottolengui, New York:

My response to your inquiries must be rather brief. First you ask me, How do I obtund sensitive dentin? I am still fogy enough to like hot air and sharp instruments. Once in a while I get a little benefit with cocain pressure used exactly as it is for removing pulps.

To your second inquiry, I must say that I am not using any of the various syringes. Such experiments as I made with one was not sufficiently satisfactory to make it of much value to me.

The third inquiry I am not prepared to answer.

Fourth, you ask me if in my opinion cocain solution enters the pulp, and if so, whether I would anticipate evil results. I am quite confident that with the powerful syringes used, cocain solutions are forced into the pulp, and I certainly will expect in the near future to hear of trouble or in the distant future to find those pulps having pulp-nodules.

Fifth, you ask how cocain introduced with a syringe compares with cocain cataphoresis; in the former method the cocain is badly injected into the pulp; by cataphoresis the cocain is separated electrically into its component ions.

Dr. J. D. Patterson, Kansas City:

(1) I have two methods, first, the dehydration method; and, second, cocain pressure method.

(2) No.

(3) In dehydration, desensitization is accomplished by the use of hot air which removes the water from the protoplasm contained in the dentinal canaliculi, so that sensation is not conveyed to the pulp as when the tubules are filled with incompressible water (80 per cent). In the cocain method for desensitization the cocain acts as an analgesic by virtue of its anesthetic effect, and by constriction of the vascular pulp tissue and protoplasmic contents of the dentinal tubules.

(4) I believe the cocain does sometimes enter the pulp when used to obtund sensitive dentin, but often relief is obtained by the action of the cocain on the contents of the tubule alone. I prefer that the pulp shall not be penetrated by the cocain unless the pulp is to be obliterated. Whether the pulp is prejudiced if penetrated by cocain I do not know, but because I fear it may be I prefer dehydration methods, for experience has taught that little danger to the pulp comes by drying the contents of the tubules.

(5) I have had no personal experience with cocain cataphoresis, and my observation regarding it is that it is unsatisfactory.

Dr. Weston A. Price, Cleveland:

(1) I use chiefly cataphoresis for extreme sensitiveness, local application of cocain in campho-phénique, etc., for slight sensitiveness, and, if pulp is to be removed for bridge abutment or otherwise, pressure anesthesia with cocain.

(2) Yes, generally effective, sometimes either painful or slow. I am afraid to use it where I do not intend removing the pulp.

(3) Cocain produces anesthesia of the dentin or pulp, or both, but not essentially the latter to desensitize the former.

(4) The cocain solution may or may not enter the pulp according to the relation of time and propelling force to the resistance, and the unfavorable effect will depend upon the quantity and local conditions. Personally I am afraid to use it applied with a high pressure syringe unless I expect to remove the pulp.

(5) A larger quantity is introduced which is not so active per unit, nor so safe as when applied cataphorically. One-fourth of a milliampere of current will require about forty minutes to carry one-hundredth of a grain of cocain into a tooth. Under good conditions many times that amount in a second can be forced in with a pressure syringe, with danger of mechanically producing a lesion of the pulp tissue.

Dr. John S. Marshall, U. S. Army, San Francisco:

(1 and 2) The dental surgeons of the United States Army are not provided with

cataphoric outfits nor with the various syringes intended for the above purpose. We are therefore obliged to depend upon other and simpler means of mitigating the pain produced by excavating a sensitive carious cavity. I am in the habit of adopting one of the following methods:

First, a dry cavity—secured by the rubber dam and warm air—and a sharp, clean cutting bur run at high speed and manipulated with a *light hand.* Second, a moist cavity, kept constantly flooded with a stream of hot water—as hot as the patient can bear without pain—and the use of a sharp, clean cutting bur, etc., as above.

(3) From my knowledge of and experience with cocain, I am of the opinion that when this drug is employed and forced into the tubuli, either by electric or mechanical pressure, thorough anesthesia of the dental pulp is produced. A partial or incomplete anesthesia may be produced in those dentinal fibers occupying the tubuli through which the cocain is traveling toward the pulp, but it is impossible to produce a complete anesthesia of the whole area of the dentin without first producing anesthesia of the dental pulp.

(4) There is no doubt in my mind that to produce complete anesthesia of the whole area of the dentin, the cocain must enter the pulp, but I can see no reason for "anticipating evil results therefrom" any more than that evil results should follow cocain anesthesia of the nasal mucous membrane or of the conjunctiva when employed for operations in these localities.

(5) I am unable to give an opinion based upon a practical use of the various syringes employed to produce cocain pressure anesthesia as compared with cataphoresis. I am, however, familiar with the method introduced by Dr. Teller of Chicago, and consider it just as effective for pulp-anesthesia and much more simple than cataphoresis for this purpose.

Dr. Hart J. Goslee, Chicago:

(1) For the purpose of obtunding sensitive dentin I use only dehydration with alcohol and hot air, and such anodynes as chloroform, menthol, creasote, oil of cloves, or carbolic acid, used in conjunction with a sharp bur.

(2) I am not now using any of the syringes designed for the purpose of forcing solutions of cocain into the tooth, for the reason that the amount of pressure cannot thus be easily controlled, and that any excess of pressure may produce trouble as a result of the deleterious influences which may be caused by forcing the ptomains contained in the decalcified dentin, or the cocain itself, into the apical area.

(3) In my opinion the "phenomena" may be accounted for in the fact that "desensitization of the dentin" may only obtain as a direct result of more or less complete anesthetization of the pulp.

(4) Yes, cocain does enter the pulp, and does in a measure displace the normal fluids thereof. This may and often does produce evil results because of the fact that poisonous ptomains may be forced ahead of the cocain solution, or because of the further fact that cocain is itself accredited as being a protoplasmic poison, either of which may prove such a source of irritation as to result in subsequent trouble.

(5) The action in so far as producing anesthesia is concerned is the same, but in the "electric osmosis" of cataphoresis the electrolytic action of the current would break up or destroy the ptomains and thus lessen the possibilities of subsequent trouble therefrom.

Dr. M. L. Rhein, New York:

In reply to your letter, I can only say that I do not confine myself to any one means of obtunding sensitive dentin. I still use the cataphoric application of cocain, and together with that I have been using Myers' hypodermic syringe. The action of the latter appears to me to be identical with the effect produced by cataphoresis. I have yet to discover the first bad effect on the pulp from either of them.

In this connection, I might say that I do not use either of these agents in a number of so-called cases of sensitive dentin which can be readily controlled by the use of sharp burs and the inculcation of the principles of relaxation on the part of the patient.

Dr. N. C. Leonard, Nashville:

(1) The only method I have found satisfactory for obtunding sensitive dentin is complete desiccation and the use of sharp instruments. The sliding of a dull instrument on a sensitive surface causes much greater pain than the cutting of a sharp one.

(2) I have never used any of the syringes intended for this purpose.

(3) Thorough desensitization of the dentin, in my opinion, could only be caused by anesthesia of the pulp.

(4) Therefore, I think the cocain solution would necessarily have to enter the pulp to produce this condition. I should anticipate frequent evil results from such treatment

and for this reason would hesitate to adopt it except in cases where the pulp is to be removed.

(5) I think the action of the cocain introduced in this manner identical with that introduced by cataphoresis.

Dr. A. R. Starr, New York:

(1) In regard to Question 1, I rely principally on methods of dehydration and cauterization to obtund sensitive dentin, and practice methods of accomplishing those results in conjunction with the use of sharp instruments. I do not expect much effect from local anesthetics unless the cavity is near the pulp.

(2) I have not used the new syringes for obtunding hypersensitive dentin, and cannot therefore speak for or against them; but I have little faith in them from what I have heard concerning the experience of others.

(3) In the methods I use (dehydration and cauterization) I believe that the abstraction of moisture interferes in some way with the transmission of sensation by the dentinal fibrils—how, I cannot explain, unless it be that those fibrils cannot perform the function of complete transmission of sensation in the absence of the normal amount of moisture. Cauterization, we may assume, destroys the superficial portion of the fibrils without destroying their integrity throughout. Just how far such cauterants as zinc chlorid, silver nitrate, or carbolic acid affect the fibrils I do not know, but presume that being coagulants and not very penetrating, they act only superficially.

(4) I suppose this question refers to the use of cocain with the pressure syringes, and if so I would say that I do not believe the drug reaches the pulp when injected into a small cavity made superficially; even though it did, I would not expect anything more than temporary results, and would not anticipate evil effects.

(5) I think the effect of cocain introduced cataphorically would penetrate much more deeply and produce more profound results, but this is only a conjecture on my part, for I have had no experience with the syringe method.

Dr. Frank L. Platt, San Francisco:

(1) I believe I have tried every method of obtunding sensitive dentin of which I have ever heard, both local and systemic, and have found all of them occasionally successful; even hot air works very nicely in some cases. I am now depending entirely on forcing a cocain solution into the dentin.

(2) I am now using the Myers dental obtunder, and in perhaps fifty cases in which I have used it I have yet to record a failure. I think it will always succeed if the pit drilled in the dentin is of the right size, is cut with a sharp, cleaning bur running in a true handpiece, if the syringe is in good order and the pressure kept up evenly for from one to three minutes by the watch (not by guess), the time depending on the density of the dentin and the degree of anesthesia required.

(3) I think the dentin owes its sensitiveness to prolongations from the odontoblasts or from the nerve tissue of the pulp itself, extending into the dentinal tubuli, and this being the case anything which will obtund sensation anywhere will obtund sensitive dentin if properly applied, and all the dentin may be obtunded if the application is made to penetrate deeply enough.

(4) The cocain solution must enter the pulp if the pressure is continued long enough, for I have removed pulps without pain in cases where the pit drilled into the dentin did not penetrate the pulp-chamber, while in other cases I have found the dentin sensitive beyond the zone of anesthesia where the intention was simply to excavate a shallow cavity and the pressure had been continued but a short time.

(5) My experience with cataphoresis was short and unsatisfactory, either from faulty apparatus or faulty manipulation, or both, though I bought two outfits and tried hard to use them.

The only case in which I was entirely successful was one in which a patient complained of extreme sensitiveness in a tooth in which I found the canals (after half an hour's application of the cataphoric current) carefully filled with gutta-percha. So I do not feel competent to compare the two methods.

I may say, in conclusion, that so far I have noticed no systemic effect of the cocain in using the Myers obtunder.

The replies show not as great a diversity of opinion as I expected. All, however, are cautious of too daringly entering unbeaten paths. To what extent these new methods may develop and with what safety to patient and operator time alone can tell.

Respectfully submitted,
Ellison Hillyer,
Correspondent.

Discussion.

Dr. F. E. Howard, Buffalo. While we have methods of obtunding sensitive dentin, it is not desirable to resort to them in all cases. For during the excavation of carious cavities, in a large majority of cases the pain inflicted is so slight and transitory that very simple methods usually suffice, such as desiccating the cavity and making application of simple remedies with which we are all familiar, followed by the use of sharp instruments delicately manipulated, as suggested by Dr. Johnson. Inasmuch as these methods bring about a fairly satisfactory result I do not believe we are warranted in consuming so much of the patient's time, as well as our own, to make application to obtund through the agency of cataphoresis, pressure anesthesia, or the syringe, and from the reports received it would appear that with the majority of the correspondents the more simple methods are resorted to, as I have suggested.

However, I am a little surprised that Dr. Myers' syringe is not used more generally. I say Dr. Myers' syringe because he was the first to advance the idea of forcing medicaments through the dentin by means of a powerful syringe, the others being only modifications of his instrument; therefore I wish to give him the credit due to him in this connection. Wherever there has been any anxiety as to the outcome of the effect of anesthetizing the dentin and pulp by means of this syringe, it has been by those unacquainted with the technique. It has been claimed by these that they feared bad results might follow the application of cocain under pressure of this syringe, but I believe this apprehension has not been confirmed by anyone who has had any experience with the Myers syringe. In this connection I wish to say that the preparation used by Dr. Myers is a combination of cocain and adnephrin. One tablet in fifteen drops of water results in a 5 per cent. solution of cocain and 1/1000 of adnephrin. While cocain will give fairly satisfactory results, this combination is more certain, acts more quickly, lasts longer, and furthermore if it be desirable to remove the pulp, it affords a bloodless field of operation.

I am glad to know that Dr. Marshall feels that no deleterious effect will result in these cases, and I believe that all who have had experience with the Myers syringe and formula will confirm this opinion. It has been in use about a year and a half, with phenomenal success.

Dr. Leonard expressed the opinion that the pulp proper is anesthetized, as otherwise the dentin would not be affected, and anticipates deleterious effects upon the pulp at some future time. Had he used the Myers syringe I believe he would feel differently about it. Dr. Starr, in answer to Question 4, says that he believes the drug does not reach the pulp, and that if it did, no bad results would follow.

Dr. Platt tells us that he has used the Myers syringe with very great success. In fact, he says he has not had a failure. I believe this is the indorsement made by almost everyone who has the ingenuity to properly make the application. He tells us its application must be made systematically by the watch-time and not by guess. He seems to feel that by continued pressure the pulp may become anesthetized, and also thinks that no bad results would follow. I heartily indorse what he says.

To sum up, I will say that I have used Dr. Myers' syringe and obtunding formula for about a year with great satisfaction. I do not believe the body of the pulp is ordinarily anesthetized, although it could be by long continued application. From all that I have learned I believe the anesthetic is brought in contact with the pulp, makes its impression on the periphery, and its influence is reflected back through other tubuli. Dr. Myers holds to this opinion, and he has done much experimenting. I have never had any deleterious effects follow its action on the pulp and do not anticipate such. I have never heard of a case that could be attributed directly to its action.

Dr. H. P. Gould, Brooklyn. In answering the questions of the correspondent, the pathological action of cocain has not been very fully discussed. Question 3, How do you explain the phenomena of thorough desensitization, has been almost entirely ignored. It seems to me that a thorough consideration of this question would answer the last part of Question 4, "Would you anticipate any evil results from cocain entering the pulp?"

Dr. Patterson says the cocain acts as an analgesic by its anesthetic quality and by constriction of the vascular pulp tissue and protoplasmic contents of dentinal tubules. Cocain is a poison, and the anesthetic action is acknowledged by most authorities to be due to the vasomotor constriction of the bloodvessels.

A number say that total desensitization of the dentin can only be obtained by obtunding the pulp, and some say they can see no reason for anticipating evil results from cocain entering the pulp any more than that evil results should follow cocain anesthesia of nasal and other mucous membranes.

The last are not parallel cases in any respect; the application of cocain by the oculist and aurist is simply topical, and is made to a surface having profuse surrounding anastomotic capillary circulation.

When introduced into the pulp it must, by its action, cause a constriction of the nutritive arteries, and if under heavy pressure expel all other fluids. Having no other source of supply except through the foramen, the recuperative power of the pulp is much diminished as compared with mucous tissue. Sloughing often follows the injection of a two or three per cent. solution into the mucous tissue, notwithstanding its profuse capillary circulation.

On making inquiries of a number of dentists as to the strength of solution used in the obtunding syringe, I am told by some that they use no known percentage, simply dissolving a few crystals in just enough water to carry the cocain. The solvent point of cocain is 0.48, which means that a certain given quantity of water will dissolve twice its weight of cocain. In other words that the saturated solution of cocain which may be used if made up in that way may be a 200 percentage solution.

A topical application of ten or twenty per cent. cocain, applied by means of cotton, with the excess squeezed out, will cause anesthesia of the mucous membrane lasting from thirty minutes to one hour and a half. Is it not most natural to suppose that a thorough anesthetization of the pulp with a solution of equal strength will cause an anesthesia of the pulp (which has no surrounding anastomotic nourishment) would last much longer? Considered from this standpoint what will be the result when a stronger solution is used?

To do permanent damage to a pulp under these conditions we will not need to force into it any ptomains from the decalcified dentin.

While cocain anesthesia lasts it means that the nutritive supply is cut off, and with the nutritive supply denied to any other part of the body for one hour and a half or longer, would you not naturally look for a speedy death of the tissue?

In closing, I would say most emphatically, Do not use cocain under pressure in a tooth, having no means of knowing the depth it will penetrate, unless you desire to extirpate the pulp. Permit me in this connection to quote a paragraph from a paper read before the Second District Dental Society last year:

> *Committee on Practice.* With the ever-increasing number of therapeutic agents and appliances being presented to the dental profession, we are led by a desire to take up anything that may be beneficial to our patients, to spend considerable time and money for articles which we find not as represented, or which for other reasons do not fulfill our expectations.
>
> If we had a committee on practice whose duty it would be to report to the society the results of the use of new remedies, appliances, and materials it would save us considerable trouble, expense, and probably many patients.
>
> It might be claimed that it would take too long to try the average new material presented to us; but it is my claim that we could generally well afford to wait long enough to receive a report even though it took as long as one year or more. Again, it may be argued that there are few men who could serve usefully on a committee of this kind, but there are many men in our society who have oppor-

tunities either in dispensaries or their own practice to carry on such work with very little inconvenience.

Dr. HILLYER (closing the discussion). I would like to say just a word in regard to my work suggested for next year. The society has been kind enough to give me a subject, and that is in reference to Dr. Buckley's paper. Dr. Buckley has offered to send me a description of the technique of his method, and I will take pains to have it printed and sent to every member of the society and any others who may wish it. I will ask you to make a record of the cases in which this method is used and forward it to me during the year. At the next meeting of the society I will make a report which I trust may prove of value to you.

On motion, the Correspondent's report was passed.

(To be continued.)

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

Annual Meeting of the Executive Council, held at Hanover, Ger., August 7, 1905.

PURSUANT to a resolution adopted by the Third International Dental Congress held at Paris in 1900, the founding of the International Dental Federation was determined upon, the main object of its creation being to secure the consideration of questions of general interest bearing upon dentistry, and to make the necessary preparations for future international dental congresses.

The F. D. I. began the second period of its activity with the Fourth International Dental Congress held at St. Louis in 1904. At that meeting the rules and regulations of the F. D. I. were considered anew, revised, and definitely adopted. In addition to this action, the creation of an Executive Council of fifty members, with an increase in the membership of several commissions, was decided upon.

The Executive Council is composed of the national committees of the nations that were represented at the Fourth International Dental Congress. Most countries have one or two representatives in the Executive Council, several have five (United States, England, Germany, and France). The German National Committee consists of Drs. Miller, Hesse, Hielscher, Walkhoff, and Schäffer-Stuckert.

The chairman of the Executive Council, who is also *ex officio* the president of the F. D. I. is Professor W. D. Miller, whose term of office will extend until the Fifth International Dental Congress, to be held in Berlin in 1909.

The officers of the Executive Council are as follows:

President—W. D. Miller, Berlin.

Vice-Presidents—E. Sauvez, Paris; R. Weiser, Vienna; J. H. Mummery, London.

Secretary-General—E. C. Kirk, Philadelphia.

Assistant Secretaries—Fr. Schäffer-Stuckert, Frankfort-on-Main; P. Guye, Geneva; Burton Lee Thorpe, St. Louis.

Treasurer—F. Aguilar, Madrid.

The following members were present at the meeting held in Hanover, August 1905: W. D. Miller, Berlin; Fr. Schäffer-Stuckert, Frankfort-on-Main; Kurt Hielscher, Cologne; Carl Kühns, Hanover: A. W. Harlan, New York; T. W.

Brophy, Chicago; W. B. Paterson, London; Wm. Guy, Edinburgh; G. G. Campion, Manchester; G. O. Whittaker, Manchester; W. Harrison, Brighton; Ch. Godon, Paris; E. Sauvez, Paris; R. Heidé, Paris; B. Platschick, Paris; R. Weiser, Vienna; Otto Zsigmondy, Vienna; O. Smith-Housken, Christiania; V. Haderup, Copenhagen; V. Guerini, Naples; A. Chiavaro, Rome; E. Rosenthal, Brussels; L. C. Bryan, Basel; P. Guye, Geneva; John Grevers, Amsterdam; E. Dubeau, Montreal, Canada; F. Aguilar, Madrid.

Professor Miller welcomed the members and expressed his thanks for his election at St. Louis. He made particular reference to the activity of his predecessor, the present honorary president, Professor Godon of Paris.

He next presented his views upon the most pressing problems which the present session had to consider. These consisted especially in specifying the relations between the F. D. I. and its committees on the one hand, and the national committees on the other—the adjustment of which when accomplished would certainly lead to more fruitful activity on the part of the Federation.

The foreign members were next welcomed by Dr. Heilscher on behalf of the Vereinsbundes Deutscher Zahnärzte; by Dr. Schäffer-Stuckert on behalf of the Central Verein Deutscher Zahnärzte, and by Dr. Kühns on behalf of the Vereins für Niedersachsen.

The president, Professor W. D. Miller, then read an address in which he reviewed the extensive correspondence of the past year, which had been particularly heavy on account of the great distance between the residences of the president and that of the secretary-general. The president observed that the Central Verein had at its meeting this year continued in office the national committee for Germany, and that next year, ten members should be elected from a list of twenty candidates, who in connection with the national committee are to constitute the committee to arrange for the meeting of the Fifth International Dental Congress in Berlin. The speaker particularly welcomed the English members of the F. D. I., who were present for the first time at this meeting.

The language used at the meeting was English, because upon inquiry that language was found to be understood by the majority of those present. The addresses were delivered by the speakers in their mother tongues.

The acting secretary of the meeting was Dr. Guye of Geneva, as Dr. Kirk of Philadelphia was unable to be present and had sent a letter tendering his resignation. On motion the resignation was not accepted.

Professor Wetzel of Essen tendered an invitation to the F. D. I. to visit Essen and the Krupp plant. The invitation was accepted upon the following day by a considerable number of foreign delegates.

Dr. T. W. Brophy, Chicago, next presented a report upon dental education. The report was ordered printed in three languages.

Professor Miller then presented four propositions upon the subject of the determination of the relation of the F. D. I. to the national committees. These propositions were as follows:

First: "The wishes of the national committee shall be respected in regard to all matters pertaining to their own countries, and no policy or resolution shall be undertaken or passed by the F. D. I. or its committees without the knowledge and consent of the national committee of the country which would be affected by such a resolution."

This proposition was adopted with the following amendment, "—shall be undertaken against the wishes of the national committees."

Upon motion by Dr. Paterson, London, the following addition was adopted:

"The reports of the various committees shall be submitted to the Executive Council. These reports shall be printed and distributed among the members of the Executive Council so that they may be in touch with the views of their national committees. No report shall be official which has not been accepted by the Executive Council of the F. D. I."

Professor Miller's second proposition was as follows:

"All appointments to membership in the F. D. I. or its commissions shall be made only with the consent of the national committees." Adopted.

The third proposition was—

"All national committees shall seek to obtain the recognition and indorsement of their national dental associations, in order to be able to act as the elected representatives of the dental profession of their respective countries." Adopted.

The fourth proposition was likewise adopted. It reads:

"Only such persons shall be eligible to membership in the F. D. I. who are legally entitled to practice dentistry in the country in which they reside, or in which they have obtained their professional qualifications."

The adoption of these propositions has undoubtedly contributed to make the position of the F. D. I. clearer and stronger in its relations to the conditions which obtain in different countries; it is matter of congratulation that the representatives of the various nations were enabled to cordially unite upon the basis of the above principles.

Next came the presentation of brief reports of the national committees upon the steps that have been taken recently with regard to dental hygiene among the people, and with regard to dental education in their respective countries. The reports of the subcommittees—*i. e.* those that were represented at the meeting—upon this subject were received.

The report regarding the measures adopted to promote dental hygiene in Switzerland was submitted by Dr. Guye of Geneva. With it the essayist presented the printed instructions on dental hygiene published by the Swiss Odontological Society.

Dr. Schäffer-Stuckert reported exhaustively upon the progress of dental hygiene in Germany, and submitted a considerable amount of literature bearing upon dental hygiene. On motion this report was ordered printed in three languages.

A discussion then followed on the question as to what special points should now be the immediate object of the F. D. I.'s efforts, and a great number of questions arose in this connection.

In the first place the Commission on Military and Naval Dental Service, appointed at St. Louis, not having been regularly organized, was again created in accordance with the constitution of the F. D. I., and the following representatives were elected for Germany: Professor Jessen, Strasburg, and Staff-Surgeon Dr. Richter, Chemnitz.

Drs. Schäffer-Stuckert, Frankfort-on-Main, and C. H. Witthaus, Rotterdam, were elected to the Commission on Hygiene and Public Dental Service.

A report was presented by Dr. Arkövy, Budapest, upon dental education in Hungary.

Dr. Guerini, Naples, presented a proposition concerning the project of the Italian government to grant the right of practicing dentistry to licensed physicians only.

On motion of Dr. Paterson the F. D. I. adopted the following resolution: "The Executive Council of the F. D. I. is of the unanimous opinion that Italy requires the establishment of special institutions for dental education and stands in need of a system of special dental education and legislation, in accordance with the principles laid down at the meetings of the F. D. I. in Stockholm, August 1902."

Dr. Guerini's proposition will be printed and circulated among the members of the F. D. I.

On motion of Dr. Riedel, Porto Alegre, the affiliation of the Sociedad Odontologica de Porto Alegre with the F. D. I. was concurred in.

Dr. Rosenthal, Brussels, presented a report upon the development of dentistry in Belgium.

Dr. Aguilar, Madrid, submitted a report upon the condition of the treasury of the F. D. I. The report was accepted with thanks.

A Commission upon the History of Dentistry was organized. Dr. Geist-Jacoby, Frankfort-on-Main, was elected as the German representative upon this commission. The remaining members of the commission are Drs. McManus, chairman, Thorpe, and Guerini.

A Commission upon International Dental Literature was also organized. Professor Port, Heidelberg, was elected as the member for Germany. The chairman of the commission is Dr. A. W. Harlan, New York.

In an address by Professor Haderup, "Upon the Possibility of Supplying a Good Tooth-brush at a Price Within Reach of the Poorest," the speaker stated that he is in correspondence with Paris firms regarding the furnishing of toothbrushes at 18 pf. (4½ cents) each. In conjunction with Drs. Miller and Heidé, the speaker intends to further prosecute this subject.

Dr. Smith-Housken submitted a report upon the condition of dentistry in Norway.

All the reports will be printed in the official transactions of the F. D. I.

The meeting accepted the invitation of the Swiss Odontological Society to hold the next meeting in Geneva in August 1906, in connection with the annual meeting of the Swiss Odontological Society.

MEMBERS OF COMMISSIONS APPOINTED AT HANOVER.

International Commission on Military and Naval Dental Service.—Professor Jessen, Strasburg; Staff-Surgeon Dr. Richter, Chemnitz; Dr. W. B. Paterson, London. (France reserves the appointment of two members.)

International Commission on Hygiene and Public Dental Service.—Dr. Schäffer-Stuckert, Frankfort-on-Main; Dr. Witthaus, Rotterdam.

International Commission on Nomenclature.—Dr. John Grevers (chairman), Amsterdam; Dr. V. Haderup, Copenhagen. (France reserves her appointment.)

Commission on Dental History.—Dr. Charles McManus (chairman), Hartford, Conn.; Dr. Geist-Jacoby, Frankfort-on-Main; Dr. Burton Lee Thorpe, St. Louis, Mo.; Dr. Guerini, Naples. (France reserves her appointment.)

Commission on the International Dental Press.—Dr. Coffin, London; Dr. F. Aguilar, Madrid; Dr. M. Roy, Paris; Dr. C. N. Johnson, Chicago, Ill.; Dr. G. O. Whittaker, Manchester, England.

Commission on Tooth-Brushes.—Drs. V. Haderup, Copenhagen; W. D. Miller, Berlin; and R. Heidé, Paris.

FR. SCHÄFFER-STUCKERT, *Assist. Sec'y.*

THE DENTAL COSMOS

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Devoted to the Interests of the Profession.

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EDITORIAL DEPARTMENT.

THE REPEATING TENDENCY IN DENTAL HISTORY.

THE old adage, "History repeats itself," is so frequently quoted, and the fact which it asserts has grown so familiar, that we have almost come to regard it as inevitable that history shall go on repeating itself by virtue of some inherent irresistible power or peculiarity in the thing itself, and which therefore it is useless to attempt to change or combat.

The term history in its broad general sense has such an extensive range of application that it would be impracticable even if possible to deal here with its more comprehensive relationships. There are, however, certain aspects of the history question that directly relate to dentistry in its several professional activities, and it is a consideration of these that now concerns us.

The history of dental art as recorded in its literature, especially its periodical literature, furnishes abundant material for study to anyone interested in the impulses which have given to us new ideas or inventions, all of which have had some modifying effect upon methods of practice. A consideration of the steps by which any of our established modes of procedure have been evolved from crude beginnings will furnish all the justification one would ask for a belief in the truism that history repeats itself. No idea or device has come into being as a finished product, and rarely is the initial idea, the generic principle, the creation of a single mind. The creative impulse seems to impress groups of men simultaneously, and we have the commonly observed spectacle of many claimants for originating the same invention. The records of the patent offices bear constant and remarkable testimony to this curious fact, so that invention in certain lines seems to be an incident of time in relation to circumstance. a reaction of the creative instinct to a generally recognized need responded to by groups rather than by individuals. The element of crudity, of incompleteness, that is so often observed in the original creation develops a host of attempts at improvement, so that as a rule one original idea begets a whole troop of offspring each supposedly nearer the ideally practical, yet all embodying to some degree the original purpose.

Within certain limits the very nature of the process by which new ideas are generated seems to make necessary this multiplication of imperfect efforts before the best is finally attained. The skilled artisan, the literary expert—indeed, the creative worker in any department of human activity—instinctively recognizes the fact that his first result, no matter how brilliant it may appear in all the radiance with which the element of novelty clothes it, is still defective, is still sure to exhibit weakness and imperfections when divested of the glamour of novelty and subjected to the wear and tear of experience and the test of endurance among the commonplace things of life.

Hence it is that the best results are those which have been the outgrowth of efforts more or less crude and which by constant care and intelligent improvement have come to be of lasting use and benefit. The creative process is evolutional whether it be in the domain of pure intellect or of material things. Gray's "Elegy" was seven years undergoing the refining process before it was finally given to the world as a finished product; "In Memoriam" required seventeen years of care and study by the poet laureate before it satisfied his ideal of completeness; and the steam engine is even yet undergoing improvements with respect to its economic efficiency.

It is doubtless not difficult to cite instances which are apparently the reverse of the conditions here noted and which would tend to show that occasionally great truths and epoch-making discoveries are sometimes born suddenly—burst as it were full-fledged into being from the brain of their author, who is forthwith regarded as a genius; but it is probably true that these cases of spontaneous intellectual generation are rather apparent than real, that they follow the natural process of evolution, and that the brilliancy of the birth has obscured the fact that there has been back of it a long gestative period of intellectual incubation such as is usual and normal to all such phenomena.

The bearing of the foregoing principles upon the evolution of ideas and inventions in dentistry is an interesting one. There is probably no single method, appliance, or principle in recognized use today in dentistry which possesses precisely the same character as it did when first launched. All of our filling materials, all of our appliances, all of our so-called foundation principles, have been subjected to revision, modification, and improvement—rarely at the hands of their authors, mainly by the united efforts of the many; and it is just here and in this connection that dental history repeats itself, and where it should not be permitted to repeat itself to the extent that it does.

When an inventor makes application for a patent—or if he is a wise man, before he makes the application—he informs himself as to what is commonly known as the ''state of the art''—that is to say, he searches the records and literature of his art to discover what has been done by others in the same line of activities. In this way he not only gains much collateral and possibly direct information upon the subject of his interest, but he also frequently avoids the loss of time, energy, and money which would ensue from his attempt to ignorantly duplicate the work of another inventor. The same mode of procedure is usually followed by workers in scientific departments and in pure literature as well. An examination of the literature of dentistry would seem to indicate that those who do or attempt to do creative work in dentistry have not acquired the habit of informing themselves as to the state of their art to the extent or degree that they should do in order to prevent the repetitions of dental history that fill so many pages of our literature. The author who republishes thoughts or ideas that have had a previous recognized authorship is usually regarded as illiterate, and there is no justifiable excuse for such a course in these modern times when the world's literature is accessible to all. There is less excuse for the same fault among members of a special technical profession. A fair knowledge of what that profession has accomplished, by whom it was accomplished, and when, is a kind and amount of knowledge which no member of that profession has any moral right to be ignorant of. Dental history repeats itself because of the prevalence of this type of professional illiteracy. It costs something in time and money to acquire the knowledge which is here referred to. It is not to be found in any one book, but is gotten only by systematic and intelligent reading of all the literature of dentistry, by careful notation of the important features, historical and technical, and by comparison and digestion of these principal data. It is a kind of knowledge not to be obtained in colleges, but as the result of a continuous, lifelong habit of systematic study.

The makers and would-be makers of dental history are in the main responsible for the tendency of that history to repeat itself in a way that is wasteful of our energies and an obstacle to our normal rate of progress. We would suggest a serious consideration of this matter in all of its bearings, and among the practical available means to the end in question, an earnest effort for the promotion of the study of dental history in dental colleges, the creation of committees or sections on the same subject in our dental associations, and finally, among the good resolutions of the year 1906 to include one on the part of the individual practitioner to do a specified or self-allotted amount of professional reading with the research idea as its motive, for each week of the entire year. A general carrying out of such a work would, we are sure, improve not only the literary output, but would wonderfully enlarge the professional horizon of the entire craft, and substantially limit the tendency of dental history to repeat itself.

BIBLIOGRAPHICAL.

THE AMERICAN TEXT-BOOK OF OPERATIVE DENTISTRY. In Contributions by Eminent Authorities. Edited by EDWARD C. KIRK, D.D.S., Sc.D., Prof. Clinical Dentistry, University of Pennsylvania; Editor DENTAL COSMOS; Officier de l'Académie de France. Third Edition, revised and enlarged. Illustrated with 875 engravings. Philadelphia and New York: Lea Brothers & Co., 1905.

Eight years ago it fell to the lot of the present writer to review for the DENTAL COSMOS the first edition of this now well-known and widely circulated Text-book. It is interesting to note that since that time the advancement in the theory and practice of dentistry has made necessary an enlargement of the volume by the addition of nearly two hundred pages of printed matter, none of which could have been omitted without marring the completeness of the volume as a text-book for the student and practitioner.

Two of the original contributors, Dr. Henry H. Burchard and Dr. Clark L. Goddard have, to the great loss of the profession, ceased from their labors and passed to the beyond. Dr. Burchard died shortly after the appearance of the first edition of the Text-book to which he so largely contributed, and the chapters written by him have been fully revised by the editor, Dr. Edward C. Kirk. Dr. Goddard's death occurred but a few months ago. In place of his chapter on Orthodontia the work has been enriched by a clearly written and admirably illustrated treatise on that subject by Dr. Edward H. Angle, who was selected by the editor as "the chief exponent of the modern trend of thought upon orthodontia as a problem of occlusion." The wisdom of the selection of this recognized master in orthodontia cannot be questioned. In a work of this character, however, the contributor should regard himself as, first of all a teacher. While Dr. Angle's pronounced views regarding the merits and universal applicability of his own methods are well known, it is to be regretted that as a teacher he has failed to make any allusion to many widely used appliances other than his own—such for example, as those of Dr. Jackson—some information regarding which the student would naturally expect to find in a work of this character, and for which he should not find it necessary to consult some other volume.

Another change to be noted is the withdrawal of the excellent chapter on Dental Embryology written by Dr. R. R. Andrews—for the reason, as explained by the editor, that he regards it as no longer necessary to include the general subject of dental embryology and histology in a work strictly devoted to operative dentistry; which conclusion, he states, "has compelled the retention in this work of only those special anatomical features which are directly applicable to the elucidation of dental operative procedures." This requirement is adequately met by the chapter prepared by Dr. Frederick B. Noyes on "Dental Histology with Reference to Operative Dentistry," a contribution magnificently illustrated with sections prepared with all that skill in technique of which he is so consummate a master.

A new and valuable feature of the present edition is a chapter by Dr. William Crenshaw on the "Use of the Matrix in Filling Operations." In this chapter not only the author's, but all the leading matrix devices and their modes of application are described and illustrated. There is also much excellent and soundly conservative matter relative to the preparation of cavities and the use of filling materials, instruments, etc., in cases where the matrix is employed. The whole chapter is interesting and instructive.

The subject of inlays has been entrusted to the competent care of Dr. Joseph Head, whose skill in that class of operations is recognized by the entire dental profession. His chapter, entitled "Restoration of Teeth by Cemented Inlays" is concise, practical, and sufficient; in short, it is the work of a good teacher as well as of a skilled practitioner.

Space does not permit of further enlargement upon the manifold excellences of this volume. A work on Operative Dentistry could not fail to be admirable which, in addition to writers of such distinction as those already mentioned, counts among its contributors practitioners, authors, and teachers of such recognized ability and world-wide reputation as C. N. Peirce, James Truman, Louis Jack, Edwin T. Darby, S. H. Guilford, M. H. Cryer, Edward C. Kirk, Alton Howard Thompson, Louis Ottofy, Dwight M. Clapp, Calvin S. Case, and J. D. Thomas.

In conclusion, the reviewer can unreservedly reiterate, and with added emphasis, what eight years ago he wrote regarding the "American Text-book of Operative Dentistry"—that, "In all respects it is a thoroughly admirable work, not of course entirely free from imperfections, but one which gives to the dental student, and in a form at once available, concise, and intelligible, the information he needs regarding the principles and practice of the operative dentistry of today."

W. F. L.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*Le Progrés Dentaire*, December 1905.]

ACUTE SINUSITIS OF THE FACE.

The two great sources of infection of the sinuses of the face are nasal inflammations such as coryza, and infectious phenomena in the roots of teeth.

The maxillary sinus, for instance, communicates freely with the nasal fossæ, and the roots of several of the upper teeth encroach upon its floor, so that it can be readily seen how any purulent condition of any of the structures with which the maxillary sinus is closely allied could bring about inflammatory disturbances of that cavity and likewise of the frontal and ethmoidal sinuses, with which the maxillary sinus is in open and direct communication.

Dreyfuss, quoted by Lermoyez, has reached the following conclusions regarding the nature of the inflammations of the various sinuses of the face:

(1) Maxillary sinusitis is as a rule a benign disturbance, although it may in exceptional cases involve the structures of the eye.

(2) Ethmoidal sinusitis is a dangerous pathological development, as it may result in an involvement of the cerebral meninges.

(3) Frontal sinusitis is likewise a grave disturbance, as it may eventuate in the formation of a cerebral abscess.

(4) Sphenoidal sinusitis is the one mostly to be dreaded because it usually results in an inflammation of the cavernous sinus, a condition which is practically incurable.

After describing the symptoms of maxillary sinusitis, the form most frequently encountered, the author states that the treatment should consist in preventing the purulent exudation from remaining in the sinus, and that suitable drainage should be established at once but preferably through the natural openings, and that surgical means should not be resorted to until treatment through the normal avenues has proved valueless after a considerable period of time. This recommendation does not appeal to the reviewer as being the rational course to pursue in cases of maxillary sinusitis. The position of the ostium maxillare usually found "on the upper edge of the proximal wall" (Cryer) could not under ordinary conditions afford a suitable drainage for the inflammatory products which lie deep in the floor of the sinus. Should there be weighty reasons for not establishing drainage through the alveolus of a tooth which for the purpose would have to be sacrificed, an opening through the canine fossa would certainly afford better opportunity for thoroughly draining the cavity than by means of any device that might be inserted through the ostium maxillare, a narrow and easily obliterated opening. A close examination of the relation of the antrum to the adjacent structures is the best argument which may be offered against the author's plan of treatment through the nose. After the source of the infection has been removed the author recommends to atomize the affected region with the following solution to be used four times a day:

℞—Resorcin,	gr. xxx;
Menthol,	gr. xxx;
Zinc sulfate,	gr. v;
Distilled water,	℥jss. M.

Sig.—Use in an atomizer in the treatment of maxillary sinusitis.

[*La Odontologia,* Madrid, November 1905.]

INFECTIONS OF THE NEWBORN: BUCCAL AND SALIVARY. By Dr. Macé.

The essayist states (*Revista de Medicina y Cirugía Prácticas*) that infections of the buccal cavity in the newborn are rare, but that soon after birth the mouth loses its aseptic character. Muguet or thrush is the most common type of infection in infants and is caused by the *oïdium albicans.* The types of stomatitis most frequently observed in infants and very young children are the diphtheritic, the phlegmonous and the necrotic. Leyden has described the blennorrhagic. Cases of this latter variety have been reported at various times in the DENTAL COSMOS, particularly in the issues for May 1903, on page 417; for November 1904, on page 961, and for December 1905, on page 1506.

Infections of the salivary fluid and glands are likewise occasionally observable in infants. The infections of the glandular oral structures which thus far have been reported seem to have originated in the buccal cavity, seldom through the blood or lymph channels. Durand has observed three cases of infection of the salivary glands in the newborn; one was an abscess in the parotid gland caused by the staphylococcus, the second was an abscess in the sublingual gland caused by the bacillus of Pfeiffer, and the third case was an infection of the submaxillary glandular structures caused by one of the various streptococcic forms.

[*La Odontología,* Madrid, November 1905.]

ON THE STERILIZATION OF SOLUTIONS OF COCAIN HYDROCHLORID.

The question of sterilizing cocain solutions has been widely discussed in recent years, as some of the accidents which have followed the injection of this anesthetic solution have been attributed—and justly so—to the use of preparations of cocain not absolutely sterile. The decomposition of the alkaloid was for a long time believed to be brought about by the action of the temperature to which the solutions were subjected, but experiments carried out by Arnaud and Hérissey led to a modification of the prevailing opinion concerning the effect of heat upon cocain solutions, and for a time the question seemed nearer to a satisfactory solution than ever before. These investigators found that contrary to the views held by a majority of medical and dental practitioners the stability of cocain solutions was not in the least affected by the usual methods of sterilization. Lately, however, Drs. Dufour and Ribault (*Bulletin des Sciences Pharmaceutiques,* June 1904) having decided to further pursue the study of this—a question of extreme importance to all practitioners of major and minor surgery—have found that the composition of the glass containers in which the solutions are kept, as well as the temperature to which the alkaloid is subjected for the purpose of sterilization, have much to do in bringing about the breaking up of the alkaloid into such compounds as benzoic acid and ecgonin. Thus, these investigators have found that the decomposition of the alkaloid in receptacles made of glass containing an excess of alkali and imparting a given degree of alkalinity to the solution, is brought about more quickly and easily than when kept in glass receptacles which do not convert the solution into one of alkaline reaction. The tests were carried on with glass of the three varieties mostly found on the market and in which the proportion of alkaline material varies considerably. Solutions of cocain were introduced into bottles made of these three varieties of glass and were subjected in the autoclave, some to a temperature of 130° C. (266° F.) for two hours and others at a temperature of 99.5° C. (179.1° F.) for one hour, also in the autoclave. The bottle of glass containing the largest proportion of alkaline material was placed in a water bath at boiling temperature.

The results of these experiments tended to show that the amount of cocain which undergoes decomposition is insignificant in the glass bottles which lose but a small proportion of alkaline matter, and in those which lose relatively a large amount of alkaline material when subjected to a temperature not exceeding 100° C. (212° F.). Higher temperatures than this decompose the alkaloid even though it be kept in bottles containing but a small proportion of alkaline compounds.

These experiments show therefore, and as contended by those familiar with the use of cocain, that it undergoes decomposition into such simpler compounds as benzoic acid and ecgonin when subjected even for a short time to the influence of heat varying in intensity from 212° F. upward. The experiments of Dufour and Ribault are however not without importance, as they have shown, although not conclusively, that cocain in an alkaline vehicle is more likely to undergo decomposition than when in neutral solutions, and furthermore that one source of alkalinity may be eliminated by keeping the anesthetic solutions in receptacles made of insoluble glass.

[*Deutsche Zahnärztliche Wochenschrift*, Berlin, October 7, 1905.]

STANNO-PERCHA: A COMBINATION OF TIN AND GUTTA-PERCHA FOR FILLING PURPOSES. By Dr. Arthur Scheuer.

The author speaks of the advantages and disadvantages of gutta-percha as a filling material. All the preparations heretofore in the market possess the disadvantages of undergoing considerable change in form shortly after insertion in the cavity. The mass bulges out and, exposing the cavity margins, renders possible the recurrence of the carious process. Furthermore the insertion of a gutta-percha filling is by no means an easy operation, either because it is as a rule necessary to hold the first pieces *in situ* by means of one instrument while with another the mass is adapted to the walls of the cavity, or else because particles of the filling material adhere tenaciously to the instrument. To obviate the above enumerated disadvantages Dr. Scheuer recommends the tin-gutta-percha combination suggested by A. T. Cruschtschoff as published in the *Subovratschevny Vestnik* of St. Petersburg.

The form of tin which is incorporated into the gutta-percha is the so-called sponge tin suggested by Dr. Scheuer about two years ago. It is prepared by dissolving one hundred grams of chemically pure stannic chlorid in one liter of water. The precipitation of the tin is brought about by suspending in the solution a plate of chemically pure zinc. The precipitate must be washed repeatedly and also boiled until the water shows no cloudiness whatever, the purpose of this thorough washing being to remove all particles of zinc chlorid. The washing should be continued until the litmus-paper test shows that all traces of acid have been removed. Stanno-percha is prepared by mixing in a mortar in a sand-bath equal parts of pink gutta-percha and sponge-tin. The two ingredients should be thoroughly rubbed until the whole mass assumes a grayish color. One-half of the mass is then removed from the mortar and to the remaining half is again added an equal amount of gutta-percha. The mass at first removed from the mortar is soft and is used to line the cavity, while the material which remained in the mortar and which was mixed with an additional amount of tin is used to complete the filling. A filling material thus prepared possesses several advantageous features inasmuch as it makes a dense filling, is not affected by friction, does not expand under the influence of its humid surroundings, becomes soft at a relatively low temperature, and remains so longer than the unmixed material, thus obviating the necessity of heating the instruments repeatedly. It possesses also over the older preparations the valuable feature of not adhering to the instrument when heated previous to being inserted in the cavity. Stanno-percha can be used in combination with gold or amalgam alloys. The deeper portions of the cavity are filled with stanno-percha, which acts as a protective lining to the pulp, and the filling is completed with either gold or amalgam, which materials adapt themselves perfectly to stanno-percha, especially gold when hot through annealing.

[*La Presse Medicale*, July 8, 1905.]

A CURIOUS CASE OF MERCURIAL INTOXICATION CAUSED BY AN AMALGAM FILLING. By Dr. Martinet.

The essayist reports an extraordinary case of mercurial poisoning which resulted from the filling of a small carious cavity with amalgam. The symptoms were those of severe stomatitis, and upon the hypogastric and crural regions a scarlatiniform erythema developed. Two days prior to the appearance of all these symptoms the patient had had a tooth filled with a quantity of amalgam containing certainly not over gr. $\frac{1}{3}$ of metallic mercury. *Valeat quantum valere potest.*

[*Progrès Médical*, November 4, 1905.]

THE RÔLE OF INFLAMMATORY CONDITIONS OF THE BUCCAL, NASAL, AND PHARYNGEAL MUCOUS MEMBRANES IN THE ETIOLOGY OF TUBERCULOUS INFECTIONS. By Dr. André Lombard.

Dr. Lombard has studied the different avenues through which the Koch bacillus gains entrance into the organism, and reiterates the generally accepted view that it is mainly through the digestive and respiratory channels. He has observed that the evolution of the tuberculous infection is very rapid in the presence of other infections of the lining membranes of the upper portions of the digestive and respiratory tracts, and calls attention to the imperative necessity—especially in the case of individuals with a predisposition to tuberculosis—of preventing by all rational and available means all possible infections of the mouth, nose, and pharynx, especially of the latter structure, as possessing but a limited degree of defensive force it affords a suitable field for the propagation of the bacillus tuberculosis. In order to secure as healthy a state as possible of the pharyngeal and immediately adjacent tissues, proper attention should be given to the condition of the teeth and gums, which should be brushed daily and flushed with a powerful yet unirritating solution. The tissues of the nose and pharynx should likewise be made the subject of thorough hygienic treatment.

[*Archives de Stomatologie,* Paris, November 1905.]

TREATMENT OF THRUSH WITH WEAK MERCURIAL SOLUTIONS. By Mons. Parturien.

The essayist describes the treatment of thrush as recommended by Dr. Marfan of the Hospitals of Paris. He employs 1 : 4000 solutions of either mercuric chlorid or oxycyanid. It is applied by means of the index finger, which after having been thoroughly sterilized is wound up with aseptic cotton. The solution is applied with the finger thus prepared after immersion in the antiseptic solution. The finger is pressed against the patches in order to cause the solution to penetrate deeply into the tissues. The mucous membrane should not be rubbed, as friction is apt to result in the formation of ulcers. It is claimed that one single application often suffices to destroy the parasitic influence and to bring about in a short time a complete cure. If secondary plaques should appear following the first treatment with the mercury solution, an additional application should be made which should be repeated upon the appearance of new foci of infection. In the most severe cases, however, three such treatments will cause the complete disappearance of the infection. In support of the remarkable specific virtues which he claims for the mercury solutions in the treatment of disorders of the mucous membrane of the mouth of parasitic origin, and especially of those caused by the oïdium albicans, the author reports five cases of thrush successfully treated, some by only one application and the remainder by two applications. Of these cases one was pronounced cured four hours after the initial application, another seven hours after, and the other three at periods varying from fifteen hours to three days.

[*Dental Record,* London, October 1905.]

A CASE OF HYPERTROPHY OF THE GUM. By A. Ironside.

The author reports the case of a school teacher aged twenty-nine who presented himself at the Royal Dental Hospital of London for the treatment of a marked hypertrophic condition of the gingivæ in the maxilla, especially in the incisor region, where the lateral incisor was almost hidden from view by the abnormal growth. The treatment consisted in removing all salivary deposits, cleaning the surfaces of the teeth, removing all decayed root fragments and in packing the gum pockets with copper sulfate. Between treatments the patient was directed to rub the gum with tannic acid and to use night and morning the following mouth-wash:

℞—Acidi carbolici,	ʒss;	
Liquor potassæ,	℥ss;	
Glycerinæ,	℥j;	
Aquæ,	ad ℥vj.	M.

Sig.—One teaspoonful in a tumbler of water.

The systemic treatment consisted in the administration of the following preparation:

℞—Potassii chloratis,	gr. ij;	
Tincturæ capsici,	♏ss;	
Tincturæ cardamomi comp.,	♏xx;	
Aquæ chloroform,	ad ℥ss.	M.

Sig.—To be taken three times a day after meals.

The main features of the treatment were (1) Local depletion of the hypertrophied tissues; (2) The application of tannin to the gums; (3) The frequent scaling of the teeth and packing of the gum pockets with copper sulfate; (4) The internal administration of potassium chlorate, and (5) On the part of the patient diligent cleaning of the teeth.

Since the treatment of true hypertrophy is, according to the author, somewhat radical, *i.e.* excising the alveolar margin, the above treatment might in all cases be given a preliminary trial. In the reviewer's opinion not all cases of true hypertrophy of the gum require surgical treatment, for, as he has elsewhere pointed out, "In very extensive cases involving practically all of the gum area, removal by surgical means is indicated, but in those in which the flap of tissue is apparently an outgrowth from the underlying normal gum structure, cauterizations with fifty per cent. trichloracetic acid upon alternate days has given the writer most successful results in two cases in which the growths were of the hyperplastic variety."

[*Dental Record*, London, October 1905.]

FORMIC ALDEHYD. By J. T. Bennette.

Formaldehyd or methaldehyd occurs in plants containing chlorophyll. It is a transitory product produced in the plant cells, and its presence is due to the action of sunlight on atmospheric carbon dioxid in the presence of the green coloring matter. In the plant it acts as a natural bactericide, protecting the tender growing cells from germ action. It is subsequently split up and its component atoms become part of the starch and sugar of the plant substance. The antiseptic properties of formic aldehyd were discovered by Leon in 1888, and since his conclusions were definitely confirmed by Berlioz and others in 1890 it has become of great interest to chemists and bacteriologists. It is usually prepared by passing a mixture of air and the vapor of methyl alcohol over incandescent platinized asbestos. The formation of the substance may be easily demonstrated by suspending a spiral of platinum over some wood spirit in a beaker; the spiral continues to glow and irritating fumes of CH_2O are given off. Formic aldehyd occurs in three forms: liquid, solid, and gaseous. The liquid form sold commercially as formalin is a 40 per cent. solution in water. This aqueous solution has a pungent and violently irritating and penetrating odor. It is neutral to litmus and a powerful reducing agent. Solid formaldehyd or trioxymethylene is commonly known as paraform. It is a polymer of the gas and is prepared by evaporating the saturated solution to dryness over a sand-bath, preferably in a fume chamber, as the fumes given off are unbearable, it being impossible to keep one's eyes open in an atmosphere strongly charged with the vapor. Gaseous formic aldehyd is evolved in heating paraform.

Regarding the use of formic aldehyd in the mouth the author recommends the use of 2 per cent. or 3 per cent. solutions of formalin. A drop or two of a 3 per cent. solution placed in the canal of an infected tooth will in two days, if sealed in properly, render it absolutely sterile and quite odorless. In cases in which the pulp has died without exposure it is not an uncommon occurrence to find when these teeth are opened that pericementitis supervenes; but if the chamber is drilled into through a 5 per cent. solution there is practically no risk. As an ingredient of a mouth-wash it is of value in the strength of 1 per cent. Stronger solutions should not be used for this purpose. A 10 per cent. solution is good for sterilizing instruments. In the treatment of alveolar abscess care must be taken not to force any through the apical foramen except it be not more than 3 per cent. strength. (The reviewer has seen cases in which even the 3 per cent. solution caused severe inflammatory phenomena in the periapical region.

Discussing the advantages of formaldehyd over the coagulating agents in the treatment of root-canals the author states, referring to the diffusibility of formaldehyd and to the coagulating action of carbolic acid and corrosive sublimate: "If two capillary tubes were filled with albumen, one placed in carbolic acid and the other in a solution of formaldehyd, the former would be coagulated at the end of the tube only, whereas the latter would solidify through its entire mass." The author would do well to reassure himself regarding the correctness of this statement. Dr. Edward C. Kirk in a paper on "Coagulants in the Treatment of Root-Canals" (Dental Cosmos, March 1904) and Dr. James Truman in a paper on "The Relative Penetrating Power of Coagulants" (Dental Cosmos, January 1895) have shown that the coagulants, and in particular carbolic acid and silver nitrate, do not act as barriers to their further diffusion. The author concludes his communication by referring to the properties of a few of the derivatives of paraform, such as amyloform, creasoform, eugenoform, etc.

PERISCOPE.

For Sensitive Dentin.—In shallow cavities I have good results from applying a few crystals of menthol, dissolving it in the cavity with a drop or two of absolute alcohol and then throwing a small steady stream of compressed air into the cavity until it is dry.—George Zellerbaum, *American Dental Journal.*

Zinc Oxyphosphate a Preserver of Pulp Vitality.—In large simple cavities on the buccal or occlusal surfaces of the molars, it is my belief that the vitality of the tooth is more surely conserved by filling the cavity at least two-thirds full of oxyphosphate of zinc cement, prior to the insertion of gold or amalgam.—Wm. Dwight Tracy, *Dental Brief.*

To Hasten the Solution of Gutta-Percha in Chloroform.—Chloro-percha gets out of service now and then when it is much needed because of loss of chloroform through evaporation. To get it into shape again for immediate use, add the solvent and immerse the container in a dish of hot water. The chloroform begins to boil forthwith and the material is ready for immediate application.—*Dental Office and Laboratory.*

Plaster of Paris and Paraffin-Wax an Excellent Carving Material.—If you will take ordinary paraffin wax, melt it in a large spoon, and stir plaster of Paris into it while it is in a molten condition, you will find that it will make one of the nicest carving materials that you have ever used. Make it plastic by heating, apply it to the primary crown, and allow the patient to bite into it, and you have the cast.—J. Q. Byram, *Dental Register.*

Disinfection of Hands.—K. Vogel has been trying hot air to disinfect his hands already disinfected. He found that disinfection with hot water and alcohol and then corrosive sublimate, is superior to tincture of soap method, although the latter is superior in its technique. The advantages of putting the hands into a hot-air box are obvious, as the hands sweat and bring out the germs from crevices and mouths of glands, so that they can be destroyed even with the tincture of soap.—A. W. Harlan, *Items of Interest.*

Soldering of Aluminum.—Herr Wagner of Berlin recommends the following for soldering aluminum and its alloys: He uses a flux formed of 80 parts stearic acid, 10 parts zinc chlorid, 10 parts tin chlorid. Any ordinary soft solder can be employed, but the best is that composed of 80 parts tin and 20 parts zinc. After the dentures to be soldered have been cleansed and passed through the flux, the soldering is done in the usual way.—Z., *Quarterly Circular.*

A Source of Failure in Approximal Fillings.—The removal of unsupported enamel is an absolute necessity, whether upon the occlusal surface, upon the buccal or lingual walls, or upon the gingival margin, not only because it has not sufficient strength to withstand the stress of mastication, but because it does not possess sufficient strength to build and condense gold against without fracturing or breaking under the force of condensation.—I. F. Wallace, *Dental Era.*

Outline of Plate.—All plates should be worn as high as possible all around, but always higher over the canine teeth than elsewhere. To know where to locate the high points, use a pair of compasses and measure the teeth which you are to use, from the median line to center of canine, transfer the measurement to the die and from that to the plate and trim accordingly, dropping suddenly back of the high point to give free play to the muscles.—L. P. Haskell, *Dentist's Magazine.*

Daily Massage of the Gum.—One of the most wholesome things that may be done after brushing, and to be done mostly, if not entirely, by the patient and daily, or should be—is massage of the gums. This may be done with the fingers pressing hard above the teeth and squeezing and working down to the edge of the gums. A little time spent each day with gum massage will result in those tissues becoming harder and more capable of resisting the incipient deposits, in fact, dislodging some that have got a foot-hold.—R. B. Tuller, *American Dental Journal.*

Aluminum Plates.—The swaging of an aluminum plate is different from the swaging of gold. Use the aluminum, which needs no annealing, and of gage No. 20. This is so soft that in an undercut case the plate is apt to tear where that portion of counter passes the ridge. To prevent this, scrape away freely a portion of the counter-die which closes into the undercut. On the lingual surface lay several folds of cloth to mallet upon. As a final swage lay six or more folds of wet paper over the plate.—L. P. HASKELL, *Dentist's Magazine.*

Sterilization of Instruments.—Preferably place all instruments into 5 per cent. lysol for half-an-hour or longer, after using. It sterilizes and does not corrode or discolor them, even if they be left in it for a week. It is well also to place them in 2 per cent. formalin solution for a few minutes before use. Forceps it is well to boil. Placing them in gasoline for a minute will remove rust from joints; if necessary to lubricate joints, use 5 per cent. lysol in vaselin. If your right-angle handpiece rusts, don't swear; soak it in gasoline, which is more effective.—THOS. FLETCHER, *Dental Record.*

The Oral Secretions.—I find in my practice that in a patient whose oral secretions are thick and ropy and not changed rapidly, there is a much greater accumulation of lime deposits about the neck of the teeth, and after these deposits are removed there is a rapid recurrence of them, so that removal of the deposits alone will not cure the condition. A change of environment or a change in the mode of living, together with systemic medication, bringing about a more healthy condition of the general system, may effect a cure for a time, or until similar conditions are again brought about.—J. A. FREEMAN, *Dental Review.*

A Hint on Impression Taking.—To prevent the plaster from flowing down the patient's throat when taking an impression, prepare the tray as follows: Puncture the impression tray near the heel, making several holes about a quarter of an inch in diameter. Build up the heel with wax to reach the palate and from this carry a piece of sheet wax forward under the tray. When taking the impression the surplus plaster will be forced through the holes and carried forward by the sheet of wax under the tray, thus effectually protecting the throat. The same result may be attained by cutting a V-shaped piece from the rear of the tray and building with wax, as described above.—F. W. STEPHAN, *Dental Review.*

Advantages of the Clasp.—There is an unjust prejudice in the minds of some patients, and also dentists, against the use of clasps. This is probably due to an improper knowledge of their advantages and disadvantages; also an insufficient knowledge of the mechanical principles involved and their practical application. The advantages of the clasp may be summed up in the statement that there is no method by which a partial plate denture can be retained with so much comfort and usefulness to the patient as with clasps. This implies that the conditions are favorable and that the method is properly applied.—GEORGE H. WILSON, *Dental Summary.*

Transplantation of Bone for the Relief of Saddle Nose, with Report of One Case.—Welty discusses the comparative merits of paraffin injections and plastic operations for the relief of nasal deformities, giving the history of a case in which he operated by transplanting a piece of bone from the crest of the tibia. Perfect bony union was not obtained, but the piece remains in place, and it is hoped permanently. The production of new tissue by paraffin injections is, he says, almost ideal, but there is the uncertainty of possible loss of vision or even life, or of other complications, while with plastic surgery the principles seem to be better established.—*Journ. of the Amer. Med. Association.*

How to Hold Inlay to Grind.—Most inlays are troublesome to hold in the fingers to grind and polish. A convenient way to do that is to melt sticky wax on the end of a small pine stick, enough to imbed the inlay close to the feather edge, while the wax is quite warm. Then cool by placing it in a cup of cold water, and proceed to keep cool while polishing, or it will come loose. While held in this position a very high polish can be obtained with a wooden polisher and pumice or an Arkansas stone. When the polishing is done, warm the inlay enough to get it off the stick, then gradually heat it up in the furnace until the wax burns off.—W. H. UPJOHN, *Dental Summary.*

Preparation of Cavity.—In preparing any cavity for an inlay, the thing of most importance is the seat of the cavity, and this must be flat; the walls must be flat and as near at right angles to the seat as is possible for them to be made. Flat planes should be obtained to assure the strain when stress is applied, and the margins should be square and never beveled as they are for gold fillings. Care should be taken that there are no undercuts to distort the matrix in its removal, and only in this latter respect does the preparation of a cavity for an inlay and one for a gold filling differ greatly. Therefore, any idea for retention one may have must be carried out with these facts in view.—CRAIG M. WORK, *Dental Summary.*

The Anatomical Articulator in Crown and Bridge Work.—I wish to lay particular stress upon the use of the anatomical articulator in crown and bridge work, and I wish to go one step farther. In bridge work I advocate taking impressions of the entire mouth and articulating models of the entire mouth. You will find that it is seldom possible to take impressions of half of the mouth, articulate them on an anatomical articulator, and obtain the same accurate results that you can obtain if you have casts of the entire mouth, and I wish to emphasize that point, because it is neglected. I believe if we would use the anatomical articulator more in our crown and bridge work we would have fewer bridges loosening in a few years.—J. Q. BYRAM, *Dental Register.*

Pyorrhea Remedies.—Dr. Black says: In the application of remedies for the treatment of pyorrhea, no caustic remedies should be employed, except, possibly, when disinfection is to be accomplished. Stimulating antiseptics are always admirable and serve to stimulate cell-development and create repair tissue while keeping the wound free from bacterial interference. The mouth is not so liable to infection as other organs, probably because the tissues are accustomed to the presence of bacteria and their toxic products, and have become immune in a measure. This fact indicates also that the pathologic manifestations of the gums must have other than a local cause, and we cannot expect to cure all cases of phagedenic pericementitis by local treatment, either medicinal or prophylactic.—*Dental Register.*

Clean Teeth and Good Health.—It is time to come to practical principles and rid our minds of the idea that it is a disgrace to remove foreign substances from the mouth. It is our duty to care for the health of the mouth in every possible form, and, when that has been accomplished, there will be from one-third to one-half less work for the physician, as many of the ailments of man are caused by mouth infection. When the slimy mucus found in the mouths of many of our young people who are nervous, and, as our physicians term it, "on the border of general decline," is properly removed and the pericemental tissues stirred to health and vigor, the improved countenance and brightened eye will soon indicate the patient's return to a general healthy condition.—LEVI C. TAYLOR, *Dental Brief.*

Treatment of Surgical Infections.—Chlumsky recommends a method which was used for six years, and which he states is better than the treatment recommended by Bier. It consists of the use of pure carbolic acid with camphor, the caustic effect of the carbolic being lost in the solution with camphor. At first it was used in equal parts; but he now prepares a solution containing pure carbolic acid, 30 grams; camphor, 40 grams; alcohol, 10 grams. This produces a clear, safe solution. In cases of acute erysipelas the skin is washed several times a day; and in more chronic cases gauze soaked in the solution is placed upon the skin. In cases where pus is present, the abscess is opened, and the solution poured into the cavity. It is also useful in tubercular fistulæ and in lymphangitis.—*New York Med. Journal.*

The Problem of Inlay Shading.—In my selection of colors for any one case I find that I gain the best results by the use of two fundamental colors: one to match the color of the dentin, the other the color of the incisal edge of the tooth. It may be necessary in procuring these two to mix other colors which you may have at hand, but in the actual building of the inlay the two will give results as good as is possible to obtain. In building up the porcelain in the matrix, reproduce as accurately as possible the color and especially the form of the dentin as it was originally. This I believe to be the most important step in gaining color. If the porcelain representing the dentin is of the same shape and color as the original dentin you have a reflection of light rays which is exactly uniform over the whole surface of both tooth and inlay, and if it were not for the intervening layer of cement, which of necessity absorbs certain of these rays, your results would be perfect.—C. H. FARRAND, *Dental Review.*

Tempering Fine Steel Instruments.—Steel is hardened by heating to a cherry-red and dipping suddenly into cold water or oil. In this condition it is altogether too hard for cutting instruments of any kind. The temper is then drawn to suit the requirements by submitting the steel to a gentle heat. The variation in hardness is indicated by the color on the surface, and when the proper color is reached the steel must be again dipped to prevent it from becoming too soft. In order to distinguish the color accurately the surface should be rubbed bright with emery cloth. Heavy tools can be "drawn" in direct contact with the heat, but fine instruments should be treated through some medium, and for this purpose I use asbestos over gas, gasoline or alcohol flame; the finer the instrument the thicker the medium should be.

The following is about the proper color: For taps and dies and metal-cutting tools, a straw color; for excavators and burs, a straw color, shading to purple; for rubber chisels, and scrapers, and wood-cutting tools, purple; for steel springs, blue.—*Dominion Dental Journal.*

Method of Resetting an Upper Denture When the Bite is Satisfactory.—Mix a medium-sized batch of plaster, pour over lower bow of articulator on glass slab and place the plate to be reset (with parts in position) on the soft plaster, sinking it about half the length of the porcelain teeth on labial and buccal surfaces. Procure plaster model in the usual manner, place it in the old plate, and with upper bow in position pour on plaster to attach model to bow. After it has set, remove the model from the plate by opening the jaws of the articulator, and by a little careful manipulation the plate can be removed from the plaster. Now take off the teeth and replace them in their respective places in the plaster on the articulator. Apply base-plate wax in usual manner and trim to desired size. (This can be found by tracing the outline of the old plate before removing from the model.) Close the articulator, flow wax around labial and buccal surfaces, attaching the teeth to base-plate, open the articulator carefully, wax up inside, finish by waxing up outside, and the plate is ready for investment.—F. H. WILLIAMS, *Dental Summary.*

Mummifying Agents in Dental Practice.—Mummifying agents are various, and act by drying, coagulating, and hardening the tissues and permeating them with an antiseptic, the object being to so alter the tissue as to render it unfavorable to the growth of germs. Copper sulfate, tannic acid, formic aldehyd, hydronaphthol, dehydrated potash, and alum are examples. The mummifying agent which I have used is from the formula of Dr. Soderberg of New South Wales. ℞—Alum exsiccatum, thymol, glycerin, of each equal parts; zinc oxid, to make stiff paste. It is to be understood that aseptic conditions are essential, and therefore the practice is to be confined to the treatment of freshly exposed or uninfected pulps. The pulp is devitalized by means of arsenous acid, and under aseptic conditions the coronal portion is removed by an engine bur. The coronal chamber is cleansed and dried, the mummifying agent under slight pressure is placed in direct contact with the amputated radicular portions, and the whole sealed with oxyphosphate cement. In some cases, due to the action of dried alum, there is discomfort following the treatment, which subsides at the end of one or two days, and the result in my experience has been absolutely satisfactory. In but one tooth so treated have I had to remove a filling and re-treat, which I attributed to faulty application. Within the last fortnight I have examined several of my cases, without in any instance observing any abnormal condition of the pericementum or overlying gum tissue.—F. D. LAMB, *Dental Record.*

New Mode of Sterilizing Instruments.—The sterilizing of instruments may be done in the following manner. Take a copper pan or kettle which is polished on the inside, and fill it with water from the hydrant. This must stay in the vessel for three and one-half hours, when it is ready for use. All germs by this time have been destroyed. If you like to boil the water you can do so, but it is not necessary. For each ounce of this water add one-half grain of sodium carbonate and place all your instruments in this. They should be scrubbed and cleaned in the sterilizing water, rinsed in another vessel, and dried with pieces of cotton cloth which have been heated to 400 degrees F. in a copper box. This is easy to do now, as electricity is so cheap, and is always ready for use. The French and other continental cooks use copper kettles and saucepans for their cooking, with a bright interior, as food always tastes better when so cooked. The small amount of colloidal copper dissolved in this manner acts as a complete sterilizer, and hence the good taste of the food. If you cannot get a suitable copper vessel, strips of polished copper may be suspended in the water to be sterilized, giving a larger surface for the water to act upon.—A. W. HARLAN, *Items of Interest.*

To Deaden Noise in the Laboratory.—The noise caused in striking up plates is often a source of annoyance to the dentist and his neighbors. The following extract from *La Nature* may therefore be of some service to our readers:

"M. Prache has, after a long study of the different kinds of vibrations and earth tremors, also of noises and shocks, which he has classified into groups in accordance with the method in which they are propagated, devised a system of preparing insulated foundations.

He experimented with a great variety of substances, and found that india-rubber was the only one which possesses in a high degree the three necessary qualities of homogenity, durability, and elasticity. By means of a series of theoretical investigations, he was able to formulate the speed with which vibrations are transmitted through rubber, which may, by having recourse to suitable precautions, become as low as a few meters only per second. Instances are given of numerous cases in which, by the use of M. Prache's foundations, machinery which has before caused considerable annoyance, has been completely silenced. In one case, the sound of a weighty hammer used for beating leather and striking 150 blows per minute on an anvil 4.72 in. in diameter, could no longer be heard through the party wall which separated the workshop from an adjoining dwelling, where a sick child was in bed. It is pointed out that there are a multiplicity of uses for this invention, especially in connection with electric power stations, which sometimes give rise to great inconvenience, especially at night, when surrounded with residences."—*Dental Record.*

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OBITUARY.

DR. HENRY H. BOULTER.

DIED at Pensacola, Florida, October 3, 1905, HENRY H. BOULTER, D.D.S., M.D., after a short illness.

Dr. Boulter was born in Sarnia, Ontario, in 1848. His parents moved to the United States while the subject of this notice was but six years of age. He resided at first in Chicago and during the last five years in Pensacola, Florida. He commenced the study of dentistry at the Northwestern College of Dental Surgery, Chicago, and was graduated from that institution with the D.D.S. degree in 1886. He practiced in Chicago during fourteen consecutive years and at Pensacola during the last five years of his life.

Dr. Boulter, who was also a graduate in medicine, had practiced that profession for three or four years before he decided to take up the study of dentistry.

He was married in 1887 to Miss Nellie Shaw of Chicago, who survives him, together with a son.

DENTAL LEGISLATION.

DENTAL LAW FOR PORTO RICO.

AN ACT PROVIDING FOR THE ORGANIZATION OF A BOARD OF DENTAL EXAMINERS.

Be it enacted by the Legislative Assembly of Porto Rico:

SECTION 1. That the Governor of Porto Rico, with the advice and consent of the Executive Council, shall appoint, after the passage of this act, three skilled dentists of good repute, residing and doing business within the Island of Porto Rico, who shall constitute a Board of Dental Examiners; but no person shall be eligible to serve on said board unless he or she shall have been regularly graduated from some reputable dental college duly authorized to grant degrees in dentistry and shall have been engaged in the practice of dentistry for a period of not less than six years previous to his appointment; Provided, however, that no person shall be eligible to serve on said board who is in any way pecuniarily connected with any dental college or dental department of any college or university. The term for which the members of said board shall hold their office shall be three years, except that one of the members of said board first to be appointed under this act shall hold office for the term of one year, one for the term of two years and one for the term of three years respectively, and until their successors shall be duly appointed and qualified.

SEC. 2. The Governor shall have the power to remove any member of the board for incompetency, gross immorality, or any abuse of power, or for any other good cause, and may fill any vacancy occasioned by removal, death, resignation or otherwise, by appointment. Any person appointed to fill any vacancy on such board, whether caused by death, resignation, removal or otherwise, shall hold office for the unexpired term of the member he is appointed to fill.

SEC. 3. Said board shall choose one of its members president and one secretary thereof, and it shall meet at least twice in each year. The proceedings thereof shall, at all reasonable times, be open to public inspection.

SEC. 4. After the passage of this act, the records pertaining to the practice of dentistry, now with the Superior Board of Health, shall be turned into the custody of the secretary of the Board of Dental Examiners.

SEC. 5. After this law goes into effect any person desiring to begin the practice of dentistry on the Island of Porto Rico shall procure from the Board of Dental Examiners a certificate that such person is entitled to practice dentistry, and in order to procure such certificate the applicant shall submit to the Board of Dental Examiners his diploma, with an affidavit setting forth the time and under what circumstances said diploma was received, and that the affiant is the person to whom the diploma was issued. Such application shall be accompanied by the affidavits of two freeholders, resident of same town or district of the Island in which the applicant resides or intends to locate, stating that the applicant is the person named in the accompanying diploma and the application for a certificate. The diplomas received by the board shall be returned to the person owning the same. Such applicant shall also submit any license obtained by examination from any state board of the United States.

SEC. 6. In the event an applicant for a certificate from the Board of Dental Examiners shall present a diploma from a dental college which is not recognized as maintaining a sufficiently high grade of standard dental instruction or a license from any state which the board considers to be not sufficient evidence of a proper dental education, the applicant shall have the privilege of being examined as to his qualifications to practice dentistry in such manner as the board shall provide, and if he shall pass such examination satisfactorily to the board, he shall receive a certificate for the practice of dentistry in the Island of Porto Rico. But if he should fail to pass such examination he shall be permitted to submit to another examination within twelve months from the time of the first examination.

SEC. 7. Every person obtaining a certificate from the board must, within thirty days from the date thereof, have the same recorded in the offices of the secretary of Porto Rico and of the Supervisor of Health. The secretary of Porto Rico and the Supervisor of Health shall indorse upon the certificate the date of the record, and charge and receive the usual fees for such service, the fees to be paid by the applicant.

SEC. 8. The board shall from time to time establish and record, in a record kept by them for that purpose, a schedule of the minimum requirements which must be complied with by the applicants for certificates to practice dentistry before they shall be entitled to receive a certificate.

SEC. 9. The board may refuse to grant a certificate to any person guilty of felony, or gross immorality, or addicted to the liquor or drug habit to such a degree as to render him unfit to practice dentistry, or to any person who may be found by the board to be insane; and may, after notice and hearing, revoke a certificate and any license which may have been granted thereon for like cause. An appeal may be taken from the action of the board to any court on the island upon the applicant giving a good and satisfactory bond in the sum of two hundred dollars, to be approved by the court, to secure the cost of such appeal, should the appeal be determined against him.

SEC. 10. It shall be the duty of the Attorney-General of Porto Rico, and of the prosecuting attorney of any district court to which an appeal from any action of the board may be taken, to represent the board in any such appeal.

SEC. 11. The board shall have power to make and establish all necessary rules and regulations for reciprocal recognition of certificates issued by other states.

SEC. 12. Each applicant for examination or for license to practice dentistry in the Island of Porto Rico, shall pay to the secretary of the board the sum of twenty-five dollars, which will be turned over to the treasurer of Porto Rico, to be by him deposited in the Board of Dental Examiners Fund hereby established, and shall constitute a fund from which shall be defrayed the entire expenses of the board, and each member of the board shall receive therefrom, upon presentation of proper vouchers or order drawn by the secretary of said board and countersigned by the president, the sum of four dollars per day or part of a day for services rendered as such examiner. The board shall keep a list of the names of all persons to whom licenses have been granted under the provisions of this act, and also all persons practicing dentistry in the Island of Porto Rico in a book provided for that purpose, with names arranged in alphabetical order.

SEC. 13. Any person who shall practice dentistry in this island in violation of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than fifty dollars nor more than two hundred dollars or sentenced to imprisonment for a period not exceeding ninety days, or both, such fine and imprisonment in the discretion of the court.

SEC. 14. Any person shall be deemed to be practicing dentistry within the meaning of this act who performs any work upon or makes an examination of the human teeth or jaws, with the purpose of performing or causing to be performed any operation thereon, or who opens an office for such purpose, or announces to the public in any way an intention to practice dentistry in any place on the Island of Porto Rico.

SEC. 15. The members of the Board of Dental Examiners are authorized to administer oath in matters regarding the discharge of their official duties. The said board is charged with the duties of enforcing this act, and it shall be the duty of any prosecuting attorney on the complaint of the board, or any member thereof, to prosecute any violation of this act; and any prosecuting attorney, who, upon receipt from the board or any member thereof, of an affidavit charging any person within his jurisdiction of a violation of any of the provisions of this act, who shall fail to prosecute such an offender criminally, shall be guilty of a breach of official duty.

SEC. 16. This act shall not apply to licensed physicians or surgeons who are hereby authorized to extract teeth or to perform surgical operations at their usual office, residence, or within the vicinity of their ordinary practice whenever in their judgment the same is necesary.

SEC. 17. All laws, acts, orders and parts thereof in conflict with this act, be and the same are hereby repealed.

SEC. 18. This act shall take effect from and after July 1, 1905.

Approved March 9, 1905.

SOCIETY NOTES AND ANNOUNCEMENTS.

AMERICAN DENTAL SOCIETY OF EUROPE.

THE next meeting of the American Dental Society of Europe will be held at Berlin, Germany, August 2, 3, and 4, 1906. A most cordial invitation is extended to members of the profession to be present.

An interesting program is already assured, and it is hoped to make this one of the most interesting and largely attended meetings in the history of the society.

GEO. O. WEBSTER, *Hon. Sec'y*,
Pariser Platz I, Berlin, Germany.

SECOND DISTRICT (N. Y.) DENTAL SOCIETY.

THE Second District Dental Society of the State of New York will hold a regular meeting on Monday evening, January 8, 1906, at the King's County Medical Library Building, 1313 Bedford ave., Brooklyn, N. Y.

An exhaustive paper will be read by Joseph William Wassall, M.D., D.D.S., of Chicago, Ill., on "Gold Inlay Restoration of Bicuspids and Molars." This will be a most valuable meeting, as the paper to be read is one of great interest at the present time, and will be discussed by prominent men of the profession.

The following dental societies have been officially invited: First District (N. Y.) Dental Society, New York Odontological Society, Central Dental Association of Northern New Jersey, New York Institute of Stomatology, and the New York Institute of Dental Technique.

A most cordial invitation is extended to all ethical members of the dental profession. A collation will be served at the close of the discussion.

LEROY S. EDWARDS, *Cor. Sec'y*,
140 Remsen st., Brooklyn, N. Y.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE forty-second annual convention of the Connecticut State Dental Association will be held in Bridgeport, Conn., Tuesday and Wednesday, April 17 and 18, 1906.

F. HINDSLEY, *Sec'y*,
Bridgeport, Conn.

NEW HAMPSHIRE DENTAL SOCIETY.

THE twenty-ninth annual session of the New Hampshire Dental Society will be held at the Pemigewassett House, Plymouth, N. H. (Gateway to the White Mountains), May 8 and 9. 1906.

F. F. FISHER, *Sec'y*,
Elm st., Manchester, N. H.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL.

ALUMNI ASSOCIATION—ANNUAL CLINIC.

THE Alumni Association of Northwestern University Dental School will hold its annual clinic on Tuesday, January 16, 1906, at the University Building, corner of Lake and Dearborn streets, Chicago, Ill.

All practitioners are invited to attend.

FRED W. PARKER, *President.*
G. B. MACFARLANE, *Sec'y*,
70 State st., Chicago, Ill.

CHICAGO COLLEGE OF DENTAL SURGERY.

ELEVENTH ANNUAL CLINIC.

THE eleventh annual clinic of the Chicago College of Dental Surgery will be held at the College Building, Chicago, January 17 and 18,

1906. This meeting will be a reunion of graduates of the college regardless of whether they are members of the alumni or not.

A very excellent program is being arranged, consisting of papers with discussions, a clinic, and a banquet.

Rates on all railroads, one-third fare on the certificate plan, have been arranged for.

Rudolph Beck, *President.*

G. V. BLACK DENTAL CLUB.

The G. V. Black Dental Club (Inc.) of St. Paul, Minn., will hold a mid-winter clinic in St. Paul, Minn., February 22 and 23, 1906.

All practitioners are most cordially invited to be present. An interesting program is being arranged. For further information address,

R. B. Wilson, *Sec'y,*
107 E. 6th st., St. Paul, Minn.

LOS ANGELES ASSOCIATION OF DENTAL ALUMNI.

The annual election of the Los Angeles Association of Dental Alumni was held Tuesday, December 5, 1905, and the following officers were selected to represent the society the coming year: Ray D. Robinson, president; E. H. Morrison, vice-president; W. E. Sibley, secretary and treasurer; L. R. Sevier, member Board of Directors.

Wm. E. Sibley, *Sec'y,*
Los Angeles, Cal.

OHIO STATE DENTAL SOCIETY.

At the fortieth annual convention of the Ohio State Dental Society, held in Columbus December 5, 6, and 7, 1905, the following officers were elected: H. L. Ambler, Cleveland, Ohio, president; H. C. Brown, Columbus, Ohio, first vice-president; C. I. Keely, Hamilton, Ohio, second vice-president; F. R. Chapman, Columbus, Ohio, secretary; Weston A. Price, Cleveland, Ohio, treasurer; directors for three years: L. P. Bethel, Columbus, Ohio; J. R. Callahan, Cincinnati, Ohio; Henry Barnes, Cleveland, Ohio; W. T. McLean, Cincinnati, Ohio.

F. R. Chapman, *Sec'y,*
305 Schultz Bldg., Columbus, Ohio.

NATIONAL CAPITAL DENTAL SOCIETY.

At a meeting of the National Capital Dental Society, held December 2, 1905, the following officers were elected for the ensuing year: Starr Parsons, president; F. F. Daly, vice-president; C. W. Cuthbertson, recording secretary; W. B. Daly, corresponding secretary; Geo. S. Waldo, treasurer; Z. W. Alderman, librarian.

The large attendance and interest at this and at all preceding meetings of this society is the best evidence of its prosperity.

W. B. Daly, *Cor. Sec'y,*
Washington, D. C.

INDIANA BOARD OF DENTAL EXAMINERS.

The Indiana State Board of Dental Examiners will hold their next regular meeting at Ft. Wayne, Ind., January 9, 10, and 11, 1906, in the office of Dr. J. S. McCurdy. All applications for examination must be filed with the secretary not later than January 4th.

For further information apply to

F. R. Henshaw, *Sec'y,*
Middletown, Ind.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS.

The next meeting of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, S. D., January 16, 1906, beginning at 1.30 p. m. All applicants for examination must bring diplomas from reputable dental colleges or affidavit of having been engaged in the practice of dentistry for at least three years immediately preceding said examination. Instruments and materials necessary to do all kinds of operative and prosthetic work will be needed at this examination. Vulcanizer and lathe will be furnished by the Board.

All applications must positively be in the hands of the secretary by January 9th.

G. W. Collins, *Sec'y*,
Vermilion, S. D.

WISCONSIN BOARD OF DENTAL EXAMINERS.

The next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates for license to practice dentistry in Wisconsin will be held in Milwaukee, January 29, 1906, at the Hotel Pfister.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry for four consecutive years, or an apprentice for five years to a dentist engaged in the reputable practice of dentistry.

For further particulars apply to

J. J. Wright, *Sec'y*,
1218 Wells Bldg., Milwaukee, Wis.

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UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING NOVEMBER 1905.

November 7.

No. 803,995, to William S. Davenport. Toothbrush.

No. 804,099, to Rolla M. Chase. Approximal matrix former.

No. 804,116, to Harry B. Gregory. Artificial tooth for bridge work.

November 14.

No. 804,200, to Varney E. Barnes. Apparatus for the correction of irregular teeth.

No. 804,211, to Monroe N. Callender. Dental switchboard.

No. 804,595, to Nathan K. Garnart. Electrical controller.

November 21.

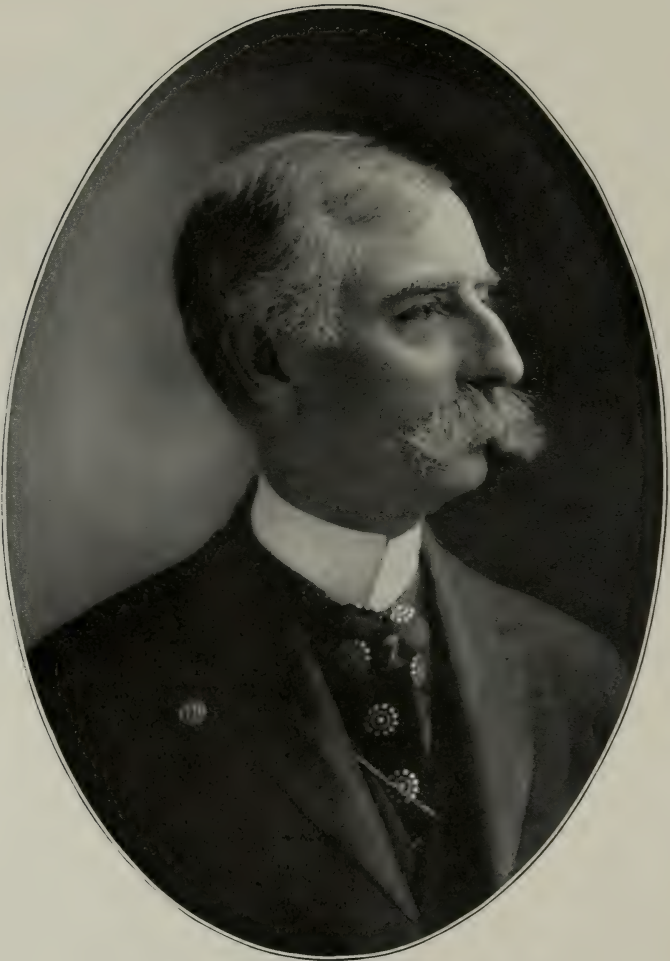
No. 805,171, to Emory L. Townsend. Artificial tooth.

November 28.

No. 805,733, to Eduardo W. Key. Toothbrush.

No. 805,974, to Peter J. Malone. Manufacture of roof dental plates.

No. 806,034, to Thomas H. Whiteside. Artificial tooth-fastening for bridge work.



DR. CHAS. C. CHITTENDEN.

THE

DENTAL COSMOS.

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ORIGINAL COMMUNICATIONS.

THE PROFESSIONAL MAN'S DISEASE.

By ELI H. LONG, M.D., Buffalo, N. Y.

(Read before Section III of the National Dental Association, Buffalo, July 25, 1905.)

IN a recent number of the *Journal of the American Medical Association* there were tabulated the causes of death of 2142 physicians occurring in 1904, showing an average age of about sixty years. The average of years of practice was about thirty. While all cases could not have the cause of death accurately stated, the summary of so considerable a number gives some data of value. The chief causes of death are stated as follows:

	No.	Per cent.
Heart disease (including sudden heart failure)	205	9.57
Cerebral hemorrhage	179	8.35
Pneumonia	172	8
Nephritis	91	4.24
Tuberculosis	90	4.2
Cancer	39	1.8

It will be noticed that heart disease was responsible for the largest number of deaths (9.57 per cent.); cerebral hemorrhage followed closely (8.35 per cent.); making a total of nearly 18 per cent. from diseases of the circulatory system. In addition to this, it is probable that in the 4.24 per cent. due to nephritis, disease of the bloodvessels predominated in a sufficient number of cases to make the total percentage for circulatory diseases fairly approximate 20 per cent., while the deaths from the two chief respiratory diseases, pneumonia and tuberculosis, together make up only 12.2 per cent.

This is in strong contrast with what obtains in all mortuary statistics up to middle life, for there deaths from respiratory diseases far exceed those from circulatory diseases. The fact is that at middle life we have passed out of the period of greatest vulnerability to infections into the period where disease is more commonly due to degeneration. This is a distinction of importance, as we shall see later.

The figures cited cannot be taken as proving that medical practitioners are more subject to diseases of the organs of the circulation than persons of all other occupations; but, taken in connection with our daily observation, it indicates that in persons who pre-eminently are living the strenuous life, the wear and tear are most productive of harm in the circulatory system. It is likely that similar results would appear in any class of professional or hard-working business men. To bring the matter a little closer home, I am convinced that what applies to the physician in this regard will apply as well to the dental practitioner. While the latter is not subject to the irregularity of sleep and of meals of the former, he works harder during his long office hours—while he also breathes less pure air and takes less exercise than his medical neighbor, which are factors of importance.

The prominence of circulatory diseases may seem to you incompatible with the statement that death from simple primary disease of the heart is not common. Except in the acute infections, in the very bad cases of valvular disease, and in rare conditions, disability of the heart represents conditions more or less general, the causes of which must be sought outside of that organ. In our search we have learned to give much attention to the bloodvessels, and particularly to the arteries. The occurrence, in such a series as this, of more than 8 per cent. of deaths from cerebral hemorrhage, forces this upon us; for this accident, commonly called apoplexy, always means disease of the arteries leading to rupture.

Viewing this as one of the common and natural terminations of life, we cannot object to the sudden blocking of the conscious activities by the presence of a blood-clot in the brain in persons who have done their life-work and have reached an advanced age; for the event is probably as painless as chloroforming and nearly as certain, if sometimes slower. But it is because of the fact that there are annually, in the aggregate, thousands of comparatively young men, among the most active and useful citizens of our country, who are either suddenly summoned, or gradually incapacitated for duty, by inroads of degeneration in the circulatory vessels—obscure at first, but capable of being retarded—that your attention is invited to this topic.

A further fact that must appeal to us is that, while many cases can be traced to a vicious life as a cause, very many still occur in those who make hard work either a cardinal virtue or an imperious master, to the neglect of the welfare of the body. While feeling that they are serving their day and generation well, they may be dishonoring their Maker in a most wasteful abuse of their powers. Be this as it may, we often see the most useful, the most needed by society and their families, cut down before their time.

This brief paper cannot attempt to analyze all factors concerned in premature degeneration, but only to emphasize the important ones, with practical suggestions as to prevention and remedy. With our present knowledge it may be stated as a fact that the degenerations of age, and particularly when occurring early, are seen most prominently in the arterial system, and that they consist of a hardening, a weakening, and a compensatory thickening of the vessel walls. Atheroma is one name applied to the condition, although the more distinctive name is endarteritis, the inner coat being the usual starting-point of the disease. Arterio-sclerosis is another term, which signifies the presence of fibrous thickening in the wall of the vessel. As you well know, these changes are often followed by calcareous deposits in the arterial wall, sometimes leading to the extreme stiffening of the vessel, which is known as "pipe-stem artery." The disease is usually evident, even early, by a palpable thickening which may be noticed in the radials and temporals, and by an increased arterial blood pressure which gives a strong pulse of high tension and an accentuation of the aortic second sound of the heart.

The pathology of endarteritis is not single. Varieties are recognized, among which the syphilitic holds a place of great frequency and importance. Heredity and diathesis must be noted among the causative factors, but as being of secondary importance in most cases. Chiefly as these factors contribute to early degeneration of tissue do they enter into consideration. Recognizing the frequent influence of early senility from whatever cause, we still come to the belief that the determining causes are mostly acquired, and preventable to the extent of postponing the occurrence of serious symptoms.

What, then, are the chief causative factors? They are of two kinds—structural and nutritional. We have entered upon the period of life when degeneration must be looked for. Recognizing this, we first mention the fact of a degenerative tendency, which is usually first seen in the lessened elasticity of the arteries. Their function of expansion during the systolic filling of the vessels and of contraction during diastole is diminished, with the result that the even distribution of the blood to the capillaries is interfered with.

It must be remembered that, while the heart's action gives force to the circulation, the reservoir and distributive function of the arteries is just as necessary to a normal circulation in the capillaries. And the fact is too commonly overlooked that in the capillary areas lies the most important part of the circulation; for the whole circulatory apparatus is arranged in order to a proper supply of blood to the cells of the tissues, where the real laboratory work of the system is carried on. As related to cellular conditions, it should be noted also that the capillaries are less abundant at this time of life, as many of them which were needed in childhood to supply the need of growth have disappeared since the completion of development. This combination of conditions would doubtless lead to early interference with cellular functions were it not for a compensatory provision in the fact that the heart grows larger and stronger as age advances. The increase of arterial pressure caused by the factors mentioned may stimulate this growth to a decided degree of cardiac hypertrophy, which for a time insures a sufficient blood supply, but which in time, with the progress of arterial degeneration, increases the danger of apoplexy. With these facts as a basis you will appreciate the statement that has become current in medicine, that "a man is as old as his arteries." Some men are older at fifty than others are at seventy, because degeneration of the circulatory system (chiefly the arteries) has progressed farther; and it may be added that no other condition can more reliably predict length of days than the condition of the arteries.

Thus far we have mentioned only the factors that are in a sense normal—that may be expected to appear in the process of aging in any person. Were these recognized at the proper time for most efficient treatment, *i.e.* before any symptoms occur, we might succeed in prolonging life and usefulness for many years in the average of our cases. But cases do not come under observation until symptoms have appeared, or in other words, until the compensatory advantages have been outweighed by the progressive degeneration.

But to these structural or physical factors there are often added those due to improper living or working, which affect the nutritive processes more directly. The faults of living may be included in the terms *high living*, *irregular hours*, and *insufficient exercise*, or more briefly still, *too much food* and *too little exercise*. The faults of working are sustained *mental* or *physical strain*, *too great concentration*, *worry*, *long hours*, but sometimes *too little work* of a kind that requires physical exercise. The symptoms first to appear are those due to deficient oxidation and deficient cellular elimination. How are these brought about? Referring again to the loss of elasticity in the arteries, please note two points: first, that the supply of blood to the capillary area is likely to be intermittent, approaching what would occur if it were forced through a series of metallic tubes; and second, that there is less total force communicated to the venous return current, with a resulting tendency to accumulation of blood in the veins. Suboxidation, faulty metabolism and deficient cell-elimination must follow, and if high living and little exercise be the rule, it is plain that we have a blood surcharged with nutriment that can neither be fully used nor oxidized into harmless products. Elimination being at the same time deficient, the sum of results will be the retention in the blood of imperfectly oxidized, irritating substances, with toxic products that have failed of elimination. That kind of blood is taken back to the heart and is thence distributed to every tissue of the body, and there must follow serious disturbances of nutrition throughout.

The heart is one of the first organs to suffer, and we have here the basis of cardiac irregularity and degeneration. The sudden deaths that so frequently occur in apparently strong and comparatively young men must usually be due to an unsuspected degeneration of heart muscle from atheroma of the coronary arteries, or to thrombosis; but the influence, upon the nutrition of the heart, of a toxic blood in constant circulation must not be overlooked as a primary factor in causing degeneration.

We have passed rapidly to the more serious results of arterial disease so as to make our outline; but attention to detail requires the mentioning of two other points: First, that suboxidation in moderate degree conduces to the formation of fat, and the increase in weight that is often seen to occur rapidly in middle life may oftentimes mean a beginning arterio-sclerosis; second, the retention of suboxidation products and waste material in the blood are to be regarded as the essential condition of the gouty diathesis. We have been beguiled by the uric acid theory and the supposed lithic acid variety of the gout family of disorders; but we have rather too slowly learned that uric acid is not the harmful substance it was formerly supposed to be, and that its accumulation is not the cause of the gouty attack. But when we recognize that auto-intoxications are the basis of most nutritional disorders we are in a position to treat them most satisfactorily, though we may not be able to name the single offending substance in any given case; so in the conditions under discussion we must appreciate the factor of auto-intoxication which necessarily occurs with either a continued suboxidation or with deficient elimination.

Arterio-sclerosis is not always evenly distributed through the system. The coronary arteries in the heart may be particularly affected, causing degeneration of the muscle through insufficient blood supply; or the disease may be more advanced in the cerebral vessels, leading to an early apoplexy from rupture, or to cerebral softening from poor supply of blood in the locality; or the disease may be more advanced in the kidneys, contributing largely to chronic Bright's disease.

Right here I wish to emphasize the importance of the above considerations in relation to the constitutional factors in gingivitis. Either the presence of local arterial changes, or auto-intoxications from a general sclerosis may be important factors in the so-called "gouty" pericementitis, and attention to the lines of general treatment to follow may be of primary importance.

In accordance with the main purpose of the paper, our discussion of treatment will be directed to prevention and to treatment of the earlier and more remediable stage of arterial disease. As hinted earlier in this paper, the treatment will be most efficient if begun before the occurrence of symptoms. Practically, however, treatment begins with the appearance of the first symptoms, unless the condition is discovered incidentally.

The treatment of early cases will be hygienic rather than medicinal. It will comprise, first of all, the correction of two very erroneous habits which prosperous and hard-working men are given to, those of over-indulgence in food and alcoholics and of taking too little exercise. We forget that metabolism is less active and that the body needs less food after development is completed, and that, the play period of life being past, proper oxidation requires more effort on our part; but if well-to-do we easily fall into the habits of luxury, loading our tissues daily with an excess of food materials whose elaboration and oxidation would overtax the average resources; then, in-consistently, we reduce our exercise by riding to our place of daily activity, our leisure hour being spent in reading, in automobiling, or at the club, without exertion on our part. If we indulge in some fashionable form of exercise it is rather as a social pleasure than a necessity, and it suffers many interruptions. In order to the best success it is essential to secure an attitude of mind that will realize that a continuance of usefulness depends upon making a business of proper living, and that is willing to follow that business continuously and indefinitely. In view of the inroads that arterio-sclerosis makes before symptoms occur, we would do well to imitate Nature in her carefulness of the female sex, by instituting a "change of life" in the male at the age of forty or forty-five. At this age the greatest strain of securing a position of usefulness and a sufficient income should be past, so that, except for the greed of fame or of acquisition, a man should be able from now on to work more leisurely and conserve his powers for a longer usefulness.

In the matter of eating, two moderate meals daily are sufficient if one will habituate himself to the plan. A third meal, if taken at all, should be light and easily digestible. The aim is to take just enough food to supply the actual daily need and no more. An abundance of water should be taken to act as a dilutent and to aid elimination. The daily routine must include enforced active exercise, in order to stimulate general circulation and complete oxidation of food materials and waste products. Walking is undoubtedly the best form of exercise, and it presents very little danger of excess to the person of ordinary strength. Bicycling, gymnastics, and bowling are excellent substitutes, but being more violent they present greater danger of excess. Whatever the form of exercise, it must be with free access of fresh air and it must require expenditure of energy. It is a mistake to suppose that the inactive open-air diversion of automobiling will take the place of exercise. The appetite will be sharpened by any out-of-door life, but if the larger amount of food thus demanded be not burned up by the active expenditure of energy, it will be deposited as fat without advantage. Any marked increase in weight at any time should place an interrogation point as to the proper adjustment of food and exercise. Massage is very useful when the condition prohibits active exercise, but, for the man who can walk, it should be regarded only as an aid.

Referring again to the importance of the capillary circulation, we urge the necessity of studying the condition of the smaller arteries, and particularly the arterioles, as a basis for another equally important line of treatment.

By their function of contraction and dilatation, the arterioles regulate the amount of blood flowing into the capillaries and thereby also the activity of cellular nutrition. This function of regulation is diminished in arterio-sclerosis, with a tendency to undue contraction in cases with deficient oxygenation of the blood—for an excess of carbon dioxid stimulates the arterioles to contraction. Therefore in spite of a high arterial pressure the capillary blood supply may be deficient. In order, then, to conserve nutrition of cells through improvement of this function, attention must be directed to the arterioles. In addition to exercise, which promotes the capillary circulation, the most efficient means of exercising the arterioles in their function of contraction and dilatation is by means of the daily cold bath. The tub or shower bath each morning, or cold sponging or pack as substitutes, will exercise the vessels in both ways; the first contact of the cold water causing a contraction which is quickly followed by a tonic dilatation that imparts a ruddy glow to the surface and gives a sense of refreshment and well-being to be obtained in no other way. Friction with a rough towel should follow in order. The cold bath also stimulates elimination by the kidneys, which adds greatly to its value in these cases. A glass or two of water taken upon arising, followed by the cold bath, will make one sensible in a short time of a very active kidney function. The circulation can in this way be flushed out in preparation for the needs of the day. Activity of the bowel function should at the same time be secured. If the person is of full habit or if elimination needs aiding, a moderate dose of a saline cathartic each morning upon arising will be in order. Regarding the cold bath, it is thought by some persons that they cannot accustom themselves to so vigorous treatment, but if the bathing be done in a warm atmosphere, so as to avoid chilliness before the bath, and if the plan is begun with water only slightly cool, reducing the temperature by degrees during weeks of treatment, always securing a good reaction by the aid of friction, nearly every person can become accustomed to a bath of 60° F. Recalling that arterio-sclerosis is a disease characterized by high arterial blood pressure which in time may become a menace to a weakened cerebral vessel, we expect the combination of restricted amount of food, active exercise, and bathing will accomplish a reduction of blood pressure and possibly of cardiac hypertrophy. In advanced cases, where degeneration of the heart has resulted, a more decided dilatation of arterioles is secured by the effervescent brine bath, known as the Schott bath. The excellent results following its use are due to the reduction of work required of the heart by removing the peripheral resistance of contracted arterioles, and to the improvement of nutrition in the cells receiving a better supply of blood.

It is of importance that the man who is working long hours or under constant strain shall lessen the tension and avoid all sources of worry. Shorter working hours and longer out-of-door exercise should be the new rule.

Among the drugs employed in this disease, potassium iodid has the reputation as an alterative of antagonizing the sclerotic process. The nitrites are positive vaso-dilators, but their action is essentially depressant and they have come to be used more as emergency remedies than in routine treatment.

THE STRENGTH OF PORCELAIN WHEN USED AS A TIP OR CORNER.

By **JOSEPH HEAD, D.D.S., M.D., Philadelphia, Pa.**

(Read before Section II of the National Dental Association, Buffalo, N. Y., July 25, 1905.)

IN displacing gold for porcelain, we are confronted with the question, Will porcelain withstand the force of mastication, not better than gold, but simply, is it efficient? There is no question of comparing it with gold, for anyone knows that in porcelain we have its brittleness to consider; and it is the relative strength and brittleness of porcelain that I have made the subject of this paper.

The principal forces that tend to dislodge a tip are pressure and percussion. These forces in the mouth may be exerted longitudinally or along the axis of the tooth, or transversely, or anywhere between these two. The more the force is exerted longitudinally, and the nearer it is exerted to the cement base, the less tendency there is for snapping of the porcelain. The more the force is exerted transversely and the farther it is exerted from the base, the greater tendency for snapping of the porcelain. Of course, when force is applied absolutely in the axis of the filling, the distance from the base theoretically makes no difference, as there is no tensile strain put on either side, and the only question involved is the resistance of the porcelain substance either to pressure or percussion.

Dr. Jenkins' tests (COSMOS, May 1902, page 458) proved that pieces of porcelain 1 centimeter square by 2.3 millimeters deep can stand a steady pressure of from one-quarter of a ton for the Whiteley to a ton for the Jenkins, the other makes falling somewhere within the intervening three-quarters of a ton. Dr. Jenkins tells us the German laboratory in which these results were obtained and how long it took to make them, but does not tell us how they were made. But I feel that these large figures could only have been obtained under the most perfect conditions, where there was pure compression without the slightest complications of percussion or shear. However, if we could approximate these conditions in the mouth, most of us would be satisfied with the Whiteley quarter of a ton resistance, as it is not likely that the human jaw would care to tax itself more than that.

So much for steady compression. On this point all porcelains are able to take care of themselves. We must, then, look to shear and percussion for its weak points. First let us consider steady shear: For this purpose we have a bar of porcelain $\frac{3}{40}$ inch by $\frac{5}{40}$ inch cemented into a block of ivory and projecting perpendicularly from its surface. These dimensions were chosen because they were felt to be safely above the average size of any tip or corner and yet to fairly well approximate the conditions. The porcelains, unless otherwise stated, were fused on platinum and afterward cut to the proper dimensions on a corundum wheel. They were identical according to the Brown & Sharpe gage within one one-thousandth of an inch. To measure the shear three separate instruments had to be made before friction, jam, and variations in the pull were successfully eliminated. But after much expense of temper and time, this simple apparatus was devised: A smooth, flat surface on a block of ivory was made by means of file, rouge, and scraper; this we shall call A. (See Fig. 1.) B represents the porcelain bar, $\frac{3}{40}$ in. by $\frac{5}{40}$ in., cemented at right angles into ivory block A. The end of block C terminates in the knife-edge of ivory that bears upon the flat side of the porcelain bar at its emergence from block A, and breaks it. Block A was screwed into a vise so that its vertical plane was in the line of gravity; then the knife-edge plane of block C was placed in position at the base of the projecting porcelain B. The planes A and C were in apposition, friction being eliminated by smoothness and oil, and attachments made to the knife-edge of C so as to bring the line of force along the coincident planes of A and C, thus giving the shear exactly at the base of the porcelain bar. When the apparatus was in position in a vise, a bucket was suspended from the ivory block C. When the weight of the bucket showed no tendency to rock the surface of the knife-edge away from the surface of A, the adjustment was considered true, and fine shot was slowly and steadily poured into the bucket until the porcelain snapped, when the shot, bucket, and block C were weighed and the result noted. Block A was then removed from the vise; the porcelain that remained in the cavity was then crushed by a small punch, reamed out with a drill, and another bar of porcelain cemented into position. The pro edure was then repeated.

The porcelains tested in this way were Jenkins, Brewster, Whiteley, and S. S. White inlay porcelain.

The Jenkins inlay material obtained in 1900 stood 23, 36, 27, 16, 33, 24, 23 lbs. Average, 26 lbs.

The latest Jenkins inlay material, improved, stood 16, 14, 16, 15, 13 lbs. Average, 15 lbs.

The Whiteley stood 28, 21, 19, 19, 18, 19 lbs. Average, 21 lbs.

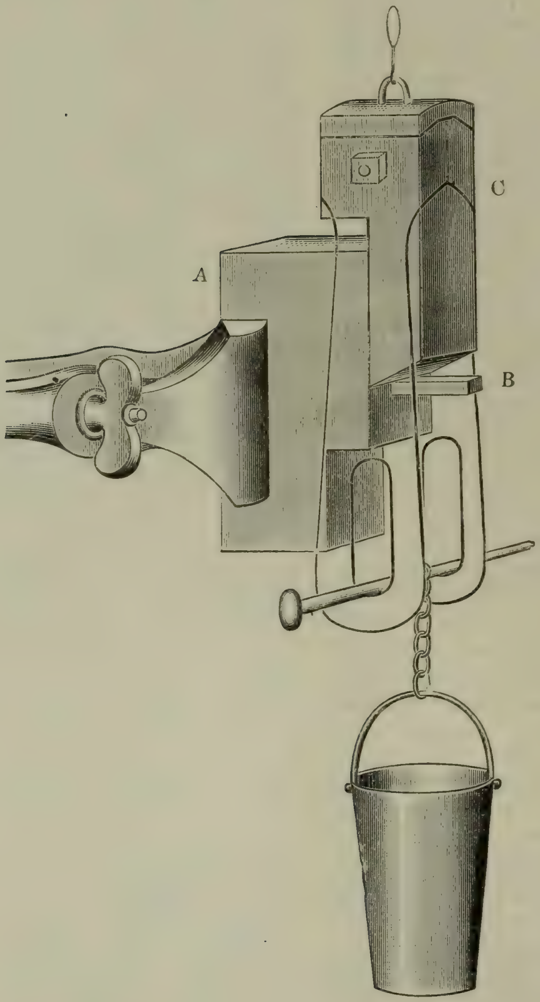
The Brewster stood 15, 20, 18, 23, 19 lbs. Average, 19 lbs.

The S. S. White stood 29, 24, 26, 24, 25 lbs. Average, 26 lbs.

Experiments were made on porcelain bars of Whiteley and S. S. White inlay materials cut from blocks of porcelain that had been made of compressed enamel, resulting in the following figures: S. S. White, 19 and 20 lbs. Whiteley, 14 and 18 lbs.

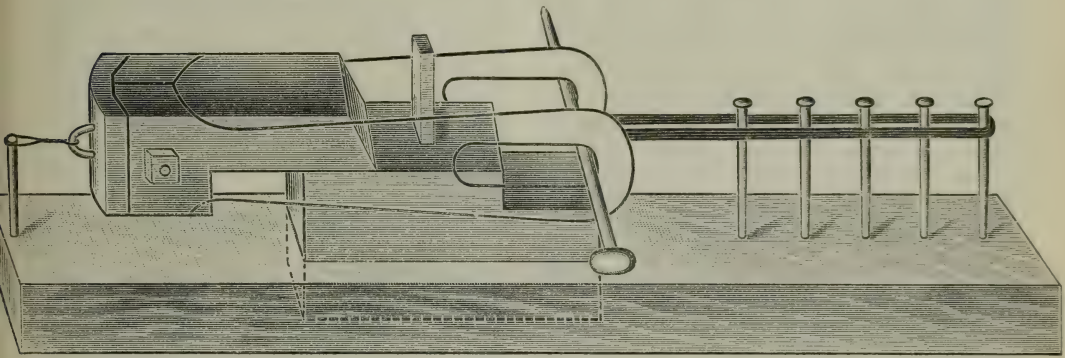
In these tests the compressed porcelain shows less strength than the uncompressed. It will be noted that the Jenkins improved material had much less shearing strength than the older material, which is probably due to the fact that Dr. Jenkins has used materials that make it a better filling material although it cannot stand so great a strain—which is quite possible, as it will be shown later that the real danger comes from percussion.

Fig. 1.



It was then determined to find out how much difference would result by making pressure out from the base of the bar. The ivory knife-edge was cut so that it rested on the porcelain bar $\frac{3}{40}$ inch out from its base, and the attachment holding the weight was adjusted to the new plane, and experiments showed that porcelain standing 26 lbs. when applied at the base, now broke at 6 lbs., showing what a tremendous difference is made by a very small leverage. Further tests were made with rubber dam wrapped around the porcelain bar where it rested in the base, and it was found that under steady, direct pressure a springy base-like peridental membrane would make no difference in the amount of pressure required to break the bar; but a percussion blow on a springy base was later found to be a different problem.

FIG. 2.



Let us now discuss the effect of a percussion blow. The same apparatus was adjusted horizontally (Fig. 2), and instead of weights, rubber bands were used to give the blow. The procedure was as follows: The ivory block holding the bar of porcelain was sunk into an oak board to make a secure foundation. The plane surface in which the porcelain rods were to be cemented was parallel and true with the surface of the board. Nails at small intervals were driven into the board for attachments for rubber bands, which when attached to the ivory wedge would snap it through a distance of ¼ inch or ⅛ inch respectively before it hit the porcelain bar. The force of the rubber bands was so arranged as to draw the ivory wedge perfectly true along the surface of the ivory before it struck the base of the perpendicular porcelain bar. After the porcelain broke, the pull of the rubber was measured by a spring balance. The distance that the plunger was held from the porcelain was controlled by a small loop of string fastened from the head of the plunger to a nail driven into the wood at a suitable place. It was found that perpendicular bars of porcelain hit by a 2-oz. plunger through a distance of ¼ inch broke at a ridiculously low figure.

A bar of Jenkins material cemented into the ivory surface with blows through ¼ inch broke at 6, 8, 7, 5, 5, 5 oz. Average, 6 oz.

Jenkins new inlay material broke at 8, 9, 8, 9, 8, 8 oz. Average, 8 oz.

The Whiteley broke at 7, 8, 9, 10, 7, 6 oz. Average, 8 oz.

Bars from Brewster body broke at 6, 5, 6, 5 oz. Average, 5.5 oz.

The S. S. White broke at 7, 6, 6 oz. Average, 6 oz.

Bars from old S. S. White tooth broke at 5, 5, 6, 5 oz. Average, 5 oz.

The S. S. White sample made from compressed porcelain broke at 5, 6, 5, 6 oz. Average, 5.5 oz.

I do not care at this time to make any deductions from these figures, but it is interesting to note that in general the porcelain that stood the least steady shearing force has the greatest percussion strength. Also that the compressed porcelain seems to have less percussion strength and less resistance to shear than porcelain made without compression. But it is possible that when we are considering pure compression, compressed porcelain may be stronger and stand even more than a ton. These bars when surrounded by rubber dam instead of cement in the ivory base broke at from 14 to 16 oz., showing that with percussion blows the spring of the peridental membrane makes an increased percentage in force required to break porcelain of about two hundred per cent.

Now we come to the effect of percussion on the surface of a simple porcelain inlay.

The machine is as follows: A ¼-inch square Jenkins inlay filling $\frac{1}{10}$ inch deep was inserted in a block of ivory with Harvard cement. The edges were parallel and perpendicular to the surface of the ivory. This was screwed into a board so that the side containing the ivory was perpendicular to the board. Then a brass plunger headed with a lower bicuspid tooth was projected against the filling through a distance of ¼ inch and ⅛ inch respectively by rubber bands. The strength of the pull of the rubber bands was measured by scales fastened to the back of the plunger.

The results obtained were as follows: The edge was slightly powdered at the first 5-oz. blow; at the third 5-oz. blow a crack ran across the corner. (This block of porcelain, the corner of which was fractured by a 5-oz. blow, was thicker than the block of porcelain of the same material claimed by Dr. Jenkins to have stood a steady pressure of 2020 lbs.) This corner began to be powdered at the fourth 10-oz. blow. These blows were all through a distance of ¼ inch. The same blows were given through ⅛ inch, and it was found that it took 7 oz. to chip the edge.

Another corner was tried, and it took 1-lb. blows to break the corner, delivered through ¼ inch.

The experiment was then tried of cutting a corner free from the cement and ivory, leaving it supported beneath about as a corner of a tooth would be. The first 5-oz. blow chipped it off a little, and then a 22-oz. blow was required to break it off entirely.

This test seemed to prove conclusively that porcelain cannot withstand the percussion force of the teeth—which force, according to Black, can readily vary from 15 lbs. to 250 lbs. It apparently can stand this force and more under steady pressure, especially as this force is usually applied through the intervening medium of food; but we must accept the fact that no porcelain has yet been made that can withstand the ordinary percussion force that at any time may be developed during mastication. The fillings must be rounded so as to receive glancing blows, the edges must be kept free as possible from strain, and if they chip, as they usually do, in an inconspicuous place, the powdered edge should be cut out with a fine inverted cone bur and filled in with gold or amalgam squeezed in on cement, slightly overlapping the porcelain with the metal. The gold and amalgam have flow and can withstand a shock by slightly yielding, and in protecting themselves they also protect the porcelain, which has no flow and can only crumble when its slight elasticity is overtaxed.

I have not gone into the subject of specific gravity, for I have not been able to find that it has any particular bearing. In fact, glass—which is porcelain fused to even consistence—according to Hovenstadt's Jena glass tests seems to resist crushing force almost inversely proportional to its specific gravity. It is interesting to note that all the thirty-five glasses tested for crushing force stood from seven to fourteen times as much as any of the porcelains tested by Dr. Jenkins. It is also of interest to note that the bars of compressed porcelain of S. S. White and Whiteley inlay material did not stand as great a test as bars of the same material molded in the ordinary way without pressure—seeming to show again that great density is not necessarily a factor that makes for strength in withstanding mastication.

These facts seem to point to the following conclusions: Any of the standard porcelains in the market are strong enough if they do not receive the full force of mastication, and none of them are strong enough if they do. So the question resolves itself into which porcelain has the best colors and which is most easily manipulated. I and many others still prefer the high-fusing porcelain, but I am glad that so many excellent porcelain workers use the low-fusing material, as, by our united efforts, dentistry will reap the combined advantages of both.

THE NOMENCLATURE OF ORTHODONTIA.

By S. H. GUILFORD, D.D.S., Ph.D., Philadelphia, Pa.

(Read before Section II of the National Dental Association, Buffalo, July 25, 1905.)

THE nomenclature of orthodontia is in more or less of a chaotic condition, owing to several causes. The rapid growth of the specialty, particularly within the past ten years, with the concomitant necessity of naming new conditions, forces, movements, etc., has created a need for new terms. As these were needed they were originated by writers according to their individual ideas, often without consideration, and more frequently without investigation as to their etymology and true meaning. Once appearing in printed form, they were adopted without question by other writers whose views were similar, and thus they have become perpetuated to a greater or less extent. In many cases new words were coined or adopted to take the place of older ones in use.

Had the new ones been intelligently selected so that they would express the idea intended to be conveyed more correctly or more scientifically, all would have been well; but unfortunately in very many instances they did not, and thus we had change without real improvement. In view of this, and influenced possibly by a spirit of conservatism, those to whom the older terms had proved satisfactory were unwilling to adopt the new ones, and thus confusion has arisen.

Undoubtedly the newer portion of the nomenclature of orthodontia contains many improvements over the old, but the old also has some valuable features that the new does not possess. If these opposing factions could be harmonized, the better terms being adopted and the worse ones eliminated, we should soon be able to place our nomenclature upon a scientific and satisfactory basis. Probably this is too much to hope for with human nature constituted as it is, and we shall have to wait for time to accomplish that which we would prefer to do immediately.

In the meanwhile let us try to hasten the desired end by urging those who have written and those who expect to write upon the subject of orthodontia, to give careful heed to the terms they use, employing only such as are sanctioned by good authority, adopting new ones only after most careful examination into their true signification and etymology, and with real broadness of mind discarding such as they have become accustomed to as soon as better ones are proposed.

One does not need to be a linguist to enable him to select satisfactory terms, for a good dictionary, if consulted, would give him the correct definition and etymology of any word, and usually also synonyms and illustrative sentences.

In speaking of the jaws, whether including the alveolar process and teeth or not, they are commonly designated the upper jaw and the lower jaw, or sometimes the superior maxilla and the inferior maxilla. It would seem as though the time had come to adopt the nomenclature of the anatomists, by calling the upper bone the maxilla and the lower one the mandible. These terms are exact and specific and cannot be confounded.

The teeth in the maxilla should be called the upper teeth, and those in the mandible the lower teeth. The terms superior and inferior, once applied to them, should be discarded, for these words have other significations, sometimes denoting quality, and are therefore not definite.

In distinguishing the teeth in the front part of the arch from those farther back the six anterior ones are often referred to as the oral teeth, and the posterior ones the buccal teeth; as *anterior* and *posterior* are terms distinctly relating to position, and have no other meaning, they should be adopted.

The same terms should also be employed wherever possible in designating the position of parts of teeth or anatomical features, as the *anterior* root of lower molars, the *anterior* buccal root of upper molars, the *anterior* pit of a bicuspid. The terms mesial root, distal root, etc., are not as expressive or as anatomically correct.

Alignment is a term which in its strict etymological sense refers to objects placed in a straight line, but there is no good reason why it should not apply to those placed in a curved line or in a series of curves. It would therefore seem to be a good word to use in referring to teeth occupying their normal positions in the dental arch; and by the addition of the prefix *mal* we have a term designating the opposite condition.

Anchorage well expresses the point of stability from which or toward which we exert force, and we have as qualifying terms the words, *simple, reinforced, reciprocal, occipital,* etc.

Arch. We have the upper arch and the lower arch, and as to the various forms, we should do away with the uneuphonious terms "V-shaped arch" and "saddle arch." For them we can substitute "Gothic arch" and "constricted arch." In addition we have the "flattened arch."

Bite. This is a very inelegant term, and very unscientific as well, yet it has come into such general use that we can hardly discard it. Its distinguishing terms are *open, close, under, over, shortening, lengthening,* etc.

Interdental, referring principally, so far as orthodontia is concerned, to spaces existing abnormally between the teeth, is an excellent term, etymologically and anatomically correct.

Irregularity and *regulating* are terms that have been much criticized owing to the impression that they are not exact and not sufficiently comprehensive. That this is erroneous is shown by the definition of the verb "to regulate," which is, "to adjust according to a standard." Our standard of teeth properly aligned is that of the normal arch, therefore if they are out of their normal condition and we restore them to it, we certainly regulate them.

Consequently the verb "to regulate," with the participle "regulating" and the substantive "irregularity"—all are etymologically correct, and as they are single words they should be preferred to phrases such as "correction of malocclusion" "dento-facial orthopedia," and the like.

Malposition may refer to one tooth or many, and is an excellent term.

Mal-eruption, signifying the eruption of a tooth, out of its proper position, is equally correct.

Normal does not mean natural, as one would often infer from its ordinary use. Its definition is "conforming to a type or standard." Its synonyms are "regular" and "typical." Therefore the expression "typically normal occlusion" which we sometimes meet with is grossly incorrect, for if the occlusion be typical it is certainly normal, and *vice versa.*

Orthodontia, a compound Greek derivitive, is the best term we have to express "the science of prevention or correction of irregularities of the teeth and the associate parts." The expression "a case of orthodontia," so often heard from the lips of the inexperienced or uneducated, indicates a misconception of the meaning of the term. We have a case of "irregularity," or "malposition," or "malocclusion," the correction of which involves a knowledge and practice of orthodontia.

Orthodontist denotes a practitioner of orthodontia. A newly-coined word, but a correct and useful one.

Orthodontic has seldom been used, but it is as etymologically correct as *orthopedic,* and will doubtless prove equally serviceable.

Prognathism and *orthognathism,* the former meaning a protrusion of the mandible and the latter a normal vertical relation between the upper and lower anterior teeth, are strictly scientific words.

Mandibular protrusion, however, might well be substituted for prognathism, and the terms "double protrusion" or "bimaxillary protrusion" can be employed when protrusion both above and below is meant.

Orthognathism denotes the condition where neither protrusion nor retrusion exists, but where both upper and lower teeth help to form the normal facial outline.

In the matter of terms to express movement, or position after movement, we fortunately have a list that is not only etymologically unexceptionable, but which serves our purpose so admirably that we could not well improve upon it. Thus from the Latin word *trudo,* meaning "to thrust or push," we have by the use of prefixes—

Extrude, to force a tooth out of its alveolus, usually a tooth that has not fully erupted and which needs to be brought to the occlusal plane of its fellows, or a tooth that has been intruded by accident.

Elevate has sometimes been used to express the same movement, but is not as good a word for the purpose, particularly as it has already acquired a distinctive meaning outside of orthodontia.

Intrude is the exact opposite of extrude, and means the forcing of the tooth into its alveolus, either in cases of accidental extrusion or where the occlusal plane of certain teeth needs to be reduced for the improvement of occlusion.

Protrude, "to force forward," and *retrude,* "to force backward," refer usually to the movement of the anterior teeth. Each of these words has its corresponding substantive ending in "sion," expressing the condition instead of the movement.

Retraction, another Latin derivative, and meaning the act of "drawing backward" something that is advanced, while having nearly the same signification as retrusion, may well be adopted to indicate specifically the drawing of a tooth backward in the line of the arch.

Expand and *expansion* are terms of accepted value, though of limited use in orthodontia.

Rotate, used to signify the turning of a tooth upon its axis, is an admirable word for our purposes, since it so exactly expresses the idea intended, the definition being "to turn upon its axis, as a wheel," but when we seek for a corresponding word to express the condition or state of a tooth already in a turned position, we are met by a difficulty, since no exactly suitable word exists in either the English or the Latin language.

The word nearest to our purpose is *torsion,* but as this denotes *twisting,* and a tooth is never twisted, the term is weak, if not really incorrect; still, as we have no more suitable word we consider it advisable to retain it.

Occlude, from Latin *ob* and *claudo,* "to close up, or shut up," has become thoroughly incorporated into orthodontic nomenclature. It has largely superseded the term *articulate,* and should supplant it entirely. If occlude means "to close," it necessitates contact, and impliedly only such contact as a hinge-joint would permit.

Articulate, long in use as an anatomical term to indicate the free movement of a joint in the animal body, has a more flexible signification in that it permits contact in various ways, but to avoid confusion and to limit the number of words, we believe that *occlude* and *occlusion* should be accepted to mean the coming together of the teeth in any way that the mandibular joint will permit. This broadening of the meaning of the term occlusion, however, should not be extended to include its use in cases where there is not and cannot be contact. Such use is misuse and therefore unjustifiable.

The coined terms "infra-occlusion," "lingual occlusion," "labial occlusion," etc., where lack of contact is meant, are very incorrect, and their employment should be discouraged. So, too, the expression "open-bite occlusion," used to designate the condition in which the anterior teeth fail to occlude, and the term "close-bite occlusion," where there is too great an overlapping of the upper anterior teeth, are both manifestly incorrect, because the language does not describe the condition. Instead, let us say "anterior non-occlusion" for the former, and "excessive overbite" for the latter.

With the acceptance of the word "occlusion" decided upon, we may readily construct from it by prefixes or qualifying words a list of terms that will be entirely serviceable and etymologically correct as well.

Malocclusion has already been adopted to express any condition in which some or all of the teeth do not occlude normally, but as yet we have had no single word to express the condition which we recognize as normal occlusion.

As the Latin prefix *mal* is correctly used to designate a "bad" or "evil" condition, we would suggest the adoption of the other Latin prefix *bene,* "well," to denote the good or correct condition. We would thus have the word—

Benocclusion to denote normal occlusion, and it would be in entire accord with other Latin compounds—as benediction, benefactor, benevolence—that have been in use for ages.

The word *orthocclusion* would be equally expressive, but in the union of two words from different languages we produce a hybrid, which in an etymological sense is regarded as objectionable.

Nonocclusion is very expressive and should be employed in the most liberal manner possible.

Anterior nonocclusion would mean failure to meet on the part of upper and lower teeth in the anterior part of the mouth.

Lateral nonocclusion, where several or all of the side teeth do not occlude.

Posterior nonocclusion, where some or all of the molars are lacking in occlusal contact.

Labial nonocclusion would signify one or more teeth in labial malposition so that occlusion is impossible; and

Lingual nonocclusion would indicate teeth lingually malposed and not in occlusion.

By the employment of the Latin prefixes *ante,* "before," and *post,* "behind," we may construct two other very useful words from the foundation term "occlusion"—

Antocclusion would signify occlusion anterior to normal; and

Postocclusion would signify occlusion posterior to normal.

Both terms could apply to a single tooth or to all of those in the arch. The adoption of these two compound words would do away with the employment of such clumsy expressions as "occlusion mesial to normal" and "position distal to normal."

All of the few new terms that I have proposed here are of Latin origin, as indeed are most of the others used in this branch of science.

Medical science derives its terms from both Greek and Latin, more perhaps from the latter, while electrical science and physics in general have taken all of their new terms from the Greek.

As Latin was the mother language of dentistry it would seem especially appropriate to depend upon it, as far as possible, for the roots from which our new terms shall be constructed.

MULTIPLE INFECTION FOLLOWING EXTRACTION OF ABSCESSED TEETH.

By D. J. BROWN, M.D., Springfield, Mass.

(Read before the Valley District Dental Society, at its monthly meeting, Springfield, Mass., December 15, 1905.)

IT is safe to assume that without exception all forms of suppuration have their origin from without. The portals through which the pyogenic organisms known as cocci and bacteria enter the system are, on one side, the lesions of the outer integument; on the other, lesions of the mucous membranes of the digestive, respiratory, and urogenital apparatus. Less numerous than the lesions of the skin, yet productive of frequent mischief, are the traumatic lesions of the mucous membranes. Slight injuries to the lips, tongue, buccal and faucial mucous membranes are very common. Healthy oral cavities and their adnexa are especially exempt from infectious processes following injuries. The writer has seen gunshot wounds of the oral cavity heal without suppuration.

On the other hand, given an oral cavity which is septic from an abscessed tooth, traumatism without preliminary and after-treatment is very dangerous on account of the possibility of extension of the suppuration to some distant point, for the epithelial covering of the mucous membrane does not seem to have the same protective power as the epidermis. If a number of micrococci gain entrance into the bottom of a wound, they at once multiply, using the blood-clot and its extensions into the bloodvessels, together with the adjacent dead and devitalized tissues, as a welcome soil for their development. The fermentive decomposition produces from its very beginning certain alkaloids, or chemical extremely poisonous substances. The ptomains are very diffusible. As a result of this diffusibility the adjacent vasó-motor nerves at once come under the toxic influence, the result of which being that a strong dilatation ensues, which becomes manifest in the shape of redness, swelling, and pain. The way of extension of septic textural destruction is two-fold: first, by direct inflammation of the tissue interstices by columns and hosts of the immensely prolific micrococci—that is, by an immediate growth and extension of the microbic colony; and secondly, by the way of the lymphatics openly communicating with the focus of suppuration, the result of which is migration of the bacteria and multiple abscesses at parts distant from the original seat of infection. The severity of the infection will greatly depend upon the nature of the microorganisms and the physical condition and age of the patient. The lymphatic glands are most active up to the age of twenty, less between twenty and thirty, and past forty they begin to atrophy and thereby offer greater resistance to the onslaught of bacteria. This is well demonstrated in persons past the age of forty who have malignant disease, the lymphatics being slow to take it up, a number of years elapsing before they break down and admit of general infection.

Case I. Margaret H., age twenty-three, a domestic. Family history negative, as also the patient's. She had always enjoyed good health and had a vigorous constitution. Six months ago developed abscess upon a tooth; there was quite pronounced swelling, also chills and fever. The tooth was extracted without preliminary precautions and no after-treatment suggested. Two days after extraction she felt a line of tenderness extending from the right side of the jaw, down the neck, chest, and abdomen to the anterior superior spine of the ilium, then extending across to the left side and upward to the twelfth rib and posteriorly into the left lumbar region. At first there was epigastric discomfort, for which she consulted a physician and was treated for indigestion without any benefit.

The patient presented herself for examination April 21, 1905. The physical examination revealed a patient well developed and perfectly nourished. Upon examination, the heart, lungs, and abdominal organs were found normal. There was a slight swelling in the right groin, with some sense of fluctuation but without redness or tenderness. For the past week, on walking, the pain in the right groin persisted but was never severe. The urine was negative. Diagnosis: Either intra- or extra-peritoneal abscess. An operation was advised, to which the patient readily consented. It was performed April 23d, under morphin-atropin-ether anesthesia. An inch incision was made and the appendix vermiformis was exposed, and as it was found normal it was returned to the abdomen and the parts were closed very carefully. A second incision was made close to and parallel with Poupart's ligament. An extra-peritoneal abscess was found, opened, and drained of a large quantity of creamy pus. The cavity was washed out, and packed with iodoform gauze, and the dressings repeated every day until recovery, which was prompt.

On August 23d the patient again presented herself for examination. The hamstring muscles of the left leg were contracted so that the leg was partially flexed. Pain was present, and the patient walked with difficulty. Physical examination: The pupils were equal and reacted well. The mucous membranes were rather pale; no enlarged glands could be detected in the chest, and the heart, lungs and liver were normal. The kidneys and spleen were not palpable. Evidently an extra-peritoneal abscess was forming in the left iliac fossa. There was pain in the region of the left kidney, evidently due also to a lumbar abscess. Under cocain the tissues were incised down to the left kidney, and a small amount of pus evacuated. From this a pure culture of the staphylococcus albus was obtained, and four days later, under nitrous oxid-ether anesthesia, an incision was made on the left side above Poupart's ligament, the abscess cavity was opened, and a large amount of pus evacuated. The urine also at this time showed the presence of pus. For a while it seemed as if the patient would recover, but shortly after, evidences of a general toxemia developed, and after a few weeks she died of general septicemia.

Here is a case clearly demonstrating secondary infection through the lymphatics from the primary seat, the oral cavity, in which a young and vigorous woman lost her life from lack of preliminary and post-operative treatment for the removal of a tooth the seat of an abscess.

Case II. A dentist's assistant had a tooth extracted which had been the seat of an abscess, without preliminary or post-operative treatment. Four days after the extraction the writer was called and obtained the following history: The physical examination revealed a well-developed and vigorous young man with negative history. A swelling was discovered on the right side of the jaw. He complained of sore throat and chills and fever. Temperature 104, pulse 120. The tooth had been extracted four days previous to the writer's visit. A swab taken from the throat was examined and revealed streptococci in abundance. The patient was desperately ill for two weeks; the convalescence was slow, but recovery was finally complete. Here again is a case in which through lack of proper precautions, we have extension of the inflammation to the tonsils and vault of the pharynx.

The two following cases which recently came under the writer's observation, show how rapidly infection will spread to distant points by way of the lymphatics through abrasions of the skin, the same as through abrasions of the mucous membranes of the oral cavity.

Case III. Six months ago a young man had a finger of the right hand crushed while at work in a foundry. The finger was dressed and the patient sent to the hospital; two days later the finger was amputated. Previous to the operation he complained of pain extending up the right arm to the shoulder, across the chest, and down the left side to the left knee-joint. The pain continued and a diagnosis of rheumatism was made and the patient treated accordingly. He did not, however, exhibit much improvement, and developed chills, fever, and sweats, which resulted in his rapidly losing ground. His anxious relatives, dissatisfied with his condition, removed him to his home and the writer saw him the following day. The skin of the left leg was dark colored from the external application of certain drugs and the limb was also swollen from knee to groin. A distinct fluctuation could be felt. Diagnosis: Secondary infection terminating in abscess following the abrasion of the skin of the right hand. Under ether anesthesia an incision was made until the abscess cavity was reached, and an enormous amount of pus was evacuated. With the exception of a stiff joint, recovery was slow but complete.

To summarize, we have here a case of secondary infection through the lymphatics, resulting from lack of proper precautions at the time of injury. Again, too much time elapsed between the injury and the operation, thereby favoring rapid migration to a distant point, finally terminating in an abscess.

Case IV. Mr Mc. Two fingers being crushed, necessitated amputation. The preliminary treatment was not active. An operation was performed forty-eight hours later, at which time he gave a history of pain extending up the right arm, across the chest, and to the left groin. Three weeks later the patient entered my service at the Mercy Hospital. He was not a vigorous man but enjoyed fair health. Family history negative. A mass was made out in the left groin. Diagnosis: Extra-peritoneal abscess. An operation was advised but was rejected, and the patient was removed to a private room and placed under the care of his family physician. Four weeks later the same patient was sent by another physician to the Springfield Hospital during my service. He was then in a most deplorable physical condition, as the mass, which at the time of the first visit was confined to the left groin, now extended upward through the lumbar space to the left kidney. His condition would not admit of general anesthesia, so the lumbar region was cocainized and an incision was made along the outer border of the quadratus lumborum muscle down to the abscess cavity and a large amount of pus was evacuated. A culture of staphylococcus albus was obtained. His recovery was tedious.

These cases clearly demonstrate how rapidly the lymphatics carry toxins and bacteria, also the necessity for thorough precautions. In the first case we have multiple infection at distant points from the seat of injury, finally terminating in general septicemia and death. In this case we have an infection from the staphylococcus, and while it does not produce as severe a type of inflammation as some others, nevertheless, owing to the multiple points of infection and the wide surface involved, conditions developed which were favorable for overwhelming absorption.

There is no germ which the surgeon dreads so much as the streptococcus. Once it gains entrance to a favorable soil, its work shows as promptly as a forest fire. In case II we have a streptococcic infection, and while we had a fortunate issue, consider what might have happened: Fatal termination owing to the great destruction of tissue, and erosion of the bloodvessels favoring hemorrhage—the writer has seen such a termination: edema of the larynx; cardiac paralysis from overwhelming toxemia; thrombosis, a portion of the septic thrombus becoming obstructed in the lungs, only to produce abscess in that organ.

TREATMENT.

The oral cavity in various conditions of health is a resting-place for many germs—among them the streptococcus and the staphylococcus. The bacillus coli communis has been found in the lingual tonsil. In twenty per cent. of healthy persons, according to Netter's observations, the diplococcus pneumoniæ is found in the buccal secretions. The tubercle bacillus is also found. Now, what earthly chance have we against such an army of invaders when the proper soil is offered them for battle? Admitting that a copious hemorrhage may wash away many germs present in the area of inflammation, how about others which may be present in the oral cavity? They can bide their time and when a blood-clot has formed at the bottom of the wound, presto! their spawning-bed is produced, and in a short time, with the barriers broken by extraction, their work of destruction soon manifests itself. It is not putting it too strongly to say that to extract teeth the seat of abscesses without careful washing previously and vigorous after-treatment, is well-nigh criminal negligence. One may argue that he has never seen any ill results; nevertheless, the fact cannot be denied that under such conditions everything is favorable for serious complications.

The surgeon does not consider his work accomplished with the mere opening and evacuating of an abscessed cavity. So likewise the surgeon dentist's work should not end with the mere abstraction of the tooth with an abscessed pericementum. Extraction should in such cases be preceded by vigorous spraying of the oral cavity with antiseptic solutions—first with hydrogen dioxid followed immediately by either Dobell's solution, a solution of sulfo-naphthol, or a solution of mercuric chlorid; or, better still, a solution which the writer uses extensively, composed of tincture of iodin, one or two drams to a pint of water. Swab the oral cavity thoroughly before and after, making sure to carry the solution into the wound. The writer has demonstrated the possibility of closing abdominal wounds infected during operation in pus cases by swabbing the edges with this solution. previous to closing it. It is used very freely. The writer has also closed wounds which might have possibly become infected during the operation for the removal of tuberculous kidneys and secured perfect union without suppuration.

Iodin is an antiseptic not fully appreciated. In emergency cases of appendicitis, where we have no time for preparation, in order to make the area for operation as aseptic as possible the writer uses the pure tincture of iodin and applies it very freely previous to making the incision. The after-treatment should also consist in washing out daily and packing with iodoform gauze. Examination should be made for enlarged glands in the immediate neighborhood of the inflammatory area. A fifty per cent. solution of ichthyol and glycerin can be used externally. Strychnin sulfate gr. 1-40 or 1-30 should be used as often as the condition of the patient requires.

Gentlemen of the dental profession, the time has come when the people should look to you for the successful treatment of this class of cases. It therefore behooves you to be on the alert, lest your medical brethren be called upon to perform work not rightfully theirs.

HYPERACIDITY OF THE SALIVA: SOME CAUSES AND SOME EFFECTS.

By HORACE L. HOWE, D.M.D., Boston, Mass.

(Read before Section II of the National Dental Association, Buffalo, N. Y., July 25, 1905.)

THAT the condition of the saliva has much to do with the diseases of the teeth is a fact which has long been recognized; therefore, to study the causes of the affections of the teeth intelligently, it is necessary to examine into the causes of the abnormal variations of the saliva.

We know that normally the saliva is of neutral or slightly alkaline reaction, but observations by Dr. Michaels of Paris and others show us that variations from the standard of health make corresponding changes in the composition and reaction of the saliva. He determined that when the saliva was normal, there was immunity to diseases of the teeth, and conversely, when it was abnormal, the teeth showed various changes as an effect. This coincides with Dr. Black's investigations regarding the cause of decay of the teeth, for he says, "Caries of the teeth is not dependent upon the teeth themselves, but upon the conditions of their environment."

Dr. Michaels also determined that when the blood becomes of a lessened degree of alkalinity because of the accumulation of acid waste products not eliminated from the system, the secretions and excretions of glands become acid in reaction; hence, to decide upon the cause of the over-acid condition of the saliva it is necessary to search out the cause of the lessened degree of alkalinity of the blood. As this condition of the blood seems to accompany most diseases, we should be compelled to search out the cause of these diseases.

Bacteriology shows that the immediate origin of many diseases is due to bacteria, but with all our increased knowledge and resources we are less free from disease, including diseases of the teeth, than were our prehistoric ancestors. That civilization, with its resultant changes in food, shelter, and occupation is responsible for the difference in general health must be the case; therefore, to try and attribute the cause of disease to any one factor, without considering the other modifying influences, would not only be useless but very unreasonable. With the advancement of civilization we have the corresponding increase of mental and nervous trouble, because the competition of today is a mental instead of a physical struggle, and the influence of the mind over digestion and health ought not to be ignored.

That the food and habits of eating are responsible for much of the difference in general health and in the health of the teeth must be the case. Civilization has made many changes in the character of our food. Instead of the coarse and simple food of our ancestors, which required much mastication, we have today soft and highly seasoned food that requires little, if any, mastication. Again, because of the increased luxury and the ease with which food is obtained, overeating has become a race habit. This fact has long been known, as is shown by the writings of Hippocrates, the Father of Medicine, born 460 B.C., who said: "Excess of food causes disease, and at the same time points out the remedy." It is interesting to know that recent observations seem to confirm this old idea. For instance, Dr. Haig of London, the expert on diet, cured himself of severe headaches by the elimination of meat from his diet, and claims that many diseases are due to excessive meat-eating.

Again, Mr. Horace Fletcher is startling the medical world with his discoveries regarding nutrition. He found out, in the attempt to restore his lost health, that by the thorough mastication and insalivation of his food he was not only restored to exceptional health, but after a time his appetite called for the simpler foods, and the amount necessary for all needs was reduced surprisingly. Deliberation in eating seemed to overcome the desire for excess of food, and the body unimpaired by injurious waste products was able to perform all its functions in a better manner. Thus we see that the same result was obtained by two different men in different ways: one by thoroughly masticating and insalivating only small amounts of food—both animal and vegetable—restored his health; the other by eliminating animal food obtained the same result; but the common factors which we notice in both cases are simplicity and the reduced amount required.

Whether our health is best maintained upon an entirely vegetable diet is not for me to say. However, it is certain that this diet in all climates would be inconsistent with the wise provision of nature, for wherever man lives he finds at hand food adapted to his needs in the climate in which he finds himself. Thus, in the coldest regions animal food is provided and is the best suited for all needs in that climate, while in the torrid zone animal food would not only be disagreeable but also unhealthful.

As we know that the condition of the teeth is dependent upon the saliva, and also that the condition of the saliva is dependent upon the state of the blood and health, it becomes of special interest to us as dentists to study the reason why the simple act of masticating thoroughly the food ingested makes such a wonderful change in the general health.

Having been troubled with severe headaches since childhood my own case seemed especially adapted for study. By so doing I found that my saliva was subject to many changes—due to state of health, to changes in food, and in the amount of mastication. I also found that by masticating vigorously a large piece of rubber my saliva changed from a neutral to very alkaline reaction. When I was troubled with a headache my saliva was quite acid in reaction; but, even then, by chewing rubber the reaction would change to a less acid condition, and sometimes even to an alkaline reaction. This seems to show that the increase in degree of alkalinity of the saliva, while eating, is largely due to the act of mastication itself.

Mr. Fletcher determined that when he thoroughly masticated and insalivated his food it became of alkaline reaction, and by so doing digestion and assimilation were improved. As practically all our solid food is acid in varying degree, the chemical action of our alkaline saliva upon our acid food, as well as the changing of the starchy food into grape sugar by the ptyalin, must be an important feature in the mouth treatment of our food.

For a moment let us trace food that is not given proper mouth-treatment. All the richer foods are more acid than the simple vegetable food. If this rich and strongly acid food be bolted and washed down with coffee, which is often acid, or beer, which is always acid, the saliva does not have a chance to act upon the starchy materials; neither is the acid reaction of the food changed by the saliva, but the whole mass goes into the stomach in an acid condition. By Anstie's law respecting glands we know that the acid-excreting gastric glands are stimulated by the presence of alkaline substances. If the food be not converted into an alkaline mass in the mouth, the stomach glands are thus deprived of their natural stimulation. The result is that after a time the stomach becomes simply a reservoir for ingested food, and does not perform its share of digestion. As every succeeding stage of digestion is modified by the preceding, we can appreciate the importance of the first step being perfectly performed. This fact is even better understood when we know that all our digestive fluids seem to alternate in reaction, each depending on the previous one for its natural stimulation. First we have the acid food stimulating the alkaline-excreting salivary glands; second, the alkaline saliva stimulating the acid-excreting gastric glands, and so on to the last, which is the alkaline pancreatic juice.

This order is remarkably well shown even in infancy, before the salivary glands are developed; for naturally the child is nourished by the human milk, which is normally alkaline. This is taken directly into the stomach, the gastric glands thus having their natural stimulation, *i.e.* alkaline milk.

As the deciduous teeth erupt the salivary glands develop; as the child is given food, the least acid food first (crackers, crusts, etc.), the saliva becomes equal to the task of converting it into an alkaline solution. If the task be too great, the stomach rebels and the food often is thrown off.

Is it a wonder that our stomachs become sour, and that assimilation and metabolism are affected, when the first or voluntary step of nutrition is ignored?—especially when we know that about three pounds of saliva are excreted and reabsorbed in a day, and when this may be so much changed by the simple act of mastication.

For a moment let us study the cow and her milk for comparison. The comparison is imperfect, but nevertheless may be of use. Cows when kept out of doors and left to feed upon grass which requires much cud-chewing to render it capable of being digested, are usually healthy and give milk of alkaline reaction. But when kept in barns and fed upon concentrated food such as animal meal, fine grain, or ensilage (which is a fermented food), they become subject to tuberculosis, inflammation of the bowels, and many other diseases. Furthermore the milk under these conditions becomes acid in reaction. As the cow is unable to chew her cud as much when fed fine and concentrated food as when fed grass and coarse food—does not the act of cud-chewing itself become a factor toward the health of the cow and the condition of the milk? We know that, normally, cows' saliva is alkaline, and that when cows chew upon one side only, the parotid saliva is increased in amount upon that side. If the cow's stomach and system are deprived of this increased amount of saliva obtained by cud-chewing, why should not the blood and milk be affected? Again, cows that have been kept in barns all winter have been known to chew pebbles or old leather in the spring. Does not instinct tell them that their systems need the saliva thus obtained?

The causes and effects of hyperacid saliva are so closely allied that it is hard to differentiate between them; however, among the factors concerned in the cause might be mentioned excess of rich and soft food, lack of elimination of the acid waste products of the system by perspiration, and lack of the neutralizing effect of alkaline saliva obtained by thorough mastication of food.

The effects of over-acid saliva would be hard to enumerate. It is certain, nevertheless, that they are varied and far-reaching. The local effects upon the teeth, manifested as erosion, caries, hypersensitiveness and pyorrhea alveolaris, are too often seen to need describing. Furthermore the systemic effects due to its reabsorption with its load of offensive secretions from the pus pockets around the teeth and from the coated tongue must be detrimental to the general health. The most logical remedy for these abnormal conditions of the saliva seems to be obtained by using to its fullest extent nature's neutralizing fluid of the system, *i.e.* alkaline saliva obtained by thoroughly masticating our food.

As the high standard of health seems to be our best safeguard for resisting disease, ought we not give the first step of nutrition—important in so many ways—its just consideration?

A NEW PORCELAIN CROWN.

By CLINT W. LA SALLE, D.D.S., Rochester, N. Y.

(Clinic—New York State Dental Society, Albany, N. Y., May 12, 1905.)

PREPARE the root (the drawing here shown is that of a central incisor) by beveling at the gum line lingually and labially, as in Fig. 1. This is to prevent fracture of the root after the crown is fastened. The root should be arched, as in Fig. 2, which is the linguogingival aspect. This bevel should be carried just under the gingival margin and no more. A porcelain facing (long pin) is selected slightly longer than the finished crown is to be, and ground from each end to the pins, as in Fig. 3. The top of the facing is then ground to a bevel as in Fig. 4. This makes it possible to get an exact junction with the root, and the gum can be raised without pain, to examine the joint. A piece of square iridio-platinum pivot wire is dressed down to fit the root-canal snugly, and bent as in Fig. 5.

FIG. 1.

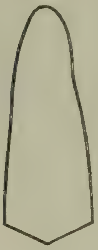


FIG. 2.

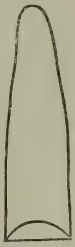


FIG. 3.

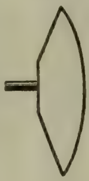


FIG. 4.

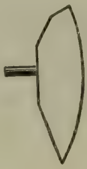


FIG. 5.

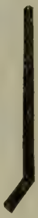


FIG. 6.

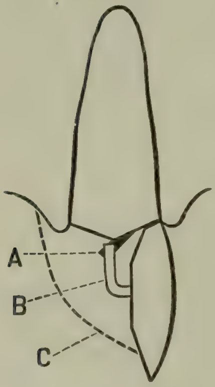


FIG. 7.

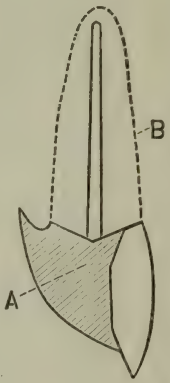


FIG. 8.

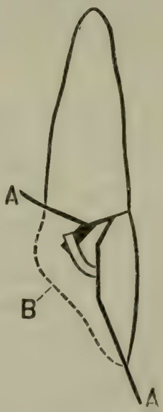
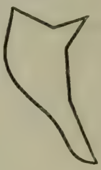


FIG. 9.



The pins in the porcelain facing are then bent as in Fig. 6. The pivot is next placed in position in the root and cut off so that the pins in the facing just grasp it. The piece is now removed and the pivot and pins are soldered together. Care must be taken to prevent the pure gold which is used in soldering from touching the facing. The soldered piece is then placed in position in the root and the facing adjusted to the root-end. If the soldering has been done as directed the facing can be twisted into any position within reason without danger of fracture. Keeping the metal away from the facing also leaves a space in which to fuse the body and prevent a shadow showing through the completed crown.

After the adjustment is complete, remove the piece and slightly oil the root-end and replace the pivot in the root. Dry the back of the facing, heat a small ball of sticky-wax, and with dampened fingers press the wax firmly to the back of the facing and over the end of the root, being careful to cover all of the exposed root-end. This impression is shown in Fig. 6, dotted line C. A bolus of zinc oxyphosphate is then prepared about the consistence of putty and worked over the pivot and down on the impression (dotted line B, Fig. 7). After the cement has hardened remove the wax and trim the cement down to the outline of the root-end, which will be indicated thereon. We now have the facing set in an imitation root which can be handled and on which accurate work can be done.

Take a piece of matrix material and place over the root-end and back of the facing (black line A—A, Fig. 8), and with wet cotton or spunk press the matrix to place. Build this up in porcelain body and bring to outline B, Fig. 8, after which the matrix is stripped off. With a pair of incising forceps the cement is cut away from the pivot and the pivot and facing placed in position in the mouth; the back is then moistened and the backing (Fig. 9) placed in position to determine whether the shade desired has been obtained. Remove all together from the root. Take a small piece of matrix material and with wet cotton press over the end of the root.

More porcelain is now mixed, and if the trial for color just given shows the crown to be too light, use a dark body, and *vice versa* if it be too dark. The back of the facing and the backing is now dried, and porcelain body applied to the back of the facing, over which the backing is placed, tapped together and dried thoroughly.

Porcelain body is now placed on the top of the crown and it is carried to the mouth. The diaphragm described above is placed on the root-end, and the crown is carried to place with fair pressure, dried with hot air, removed, and baked.

By this method the facing is heated but once, and in the preliminary bakes the piece can be removed as soon as fused. The crown is very quickly made and gives absolute control of the shade up to the last bake.

SOME MODERN THOUGHTS ALONG THE LINE OF ORAL HYGIENE.

By Dr. LEVI C. TAYLOR, Hartford, Conn.

(Read before Section III of the National Dental Association, Buffalo, July 25, 1905.)

HYGIENE, we are told, is "that branch of sanitary science which pertains to the preservation of health."

As we review the teachings of some of the ancient practitioners to ascertain their conception of oral hygiene, we seem to find little of value outside the simple cleaning of teeth. In fact, how could it be otherwise?—for the limited knowledge of all was confined to the extracting of teeth, and mechanics—a condition far too prevalent today, as the numerous gilded mouths of those we meet in our daily intercourse testify.

Among the later practitioners, Dr. John M. Riggs in 1866-68 demonstrated his methods of treating "scurvy of the gums"—as it was then called. In the early seventies Dr. Riggs renamed it "disease of the gums." Some of our more fastidious friends have chosen to call it pyorrhea, a term very common and much abused at the present time.

That dental education has made great progress no one will deny. The late Dr. Noble once told me there was not a graduate in his class who possessed the requirements to enter the poorest dental college of the present day. It is the case in this as in other fields, that the broader education opens up new avenues, and each decade the field broadens.

There is a portion of the human mouth which is conscientiously shunned by the rhinologist, he believing it to belong to the dental profession. Are we as dentists caring for those soft tissues, keeping them healthy and vigorous to the full extent, resulting in the health of our patient? Let each one answer.

One of the great drawbacks to progress is in the misunderstanding among ourselves. We use a term to convey a certain meaning, but we soon find others using the same term to convey an entirely different one. For instance, we speak of *prophylaxis* as meaning a surgical or manipulative treatment for the preservation of health, and *prophylactic* as meaning a therapeutic treatment for the preservation of health. Others use these terms alternately as though they meant one and the same thing, and in the next sentence that we find they will speak of cleansing teeth.

The term *cleanse* is defined "to purify and make clean," which in the broad sense has a slight meaning under the head of oral hygiene, but our dictionaries give us a synopsis to indicate that it is intended to be used as a religious term—*i.e.* "To walk in the light" of Jesus Christ, whose blood "cleanseth from all sin." Now, would it not be better, and make us stronger in our position, to leave this term to our religious friends, and confine ourselves to "prophylaxis," which has a much deeper meaning than the simple term "cleanse." Prophylaxis embodies the principle of cleaning the mouth generally, and it also embodies the principle of stirring up the pericemental tissues to renewed vigor, making them hard and able to endure the most rigorous manipulation.

The uncivilized man who eats raw foods uses his mouth as a mill to grind and prepare them, and as he forces his teeth into these hard and rough substances the tissues are used with a vigor that civilized life seldom encounters; and even when it does we shrink from the task, complaining that "it hurts, the gums are tender," etc.

My experience has been that as long as we leave the mouth in this tender condition, decay of the teeth predominates to an alarming extent. Our patient, often half sick, is not aware of the cause of his condition. In many instances dyspepsia appears and much pain is caused the patient while digesting the food. In young people the trouble begins in a nervous debility which if allowed to continue will result in what our medical friends call nervous prostration. In other instances general depression will follow, which finally results in rheumatic difficulties. These are some of the more common ailments developing from mouth-conditions, but there are also multitudes of others. That a large percentage of these ailments of the human family can be cured by proper manipulation of the mouth there is not the slightest doubt.

When some of our dental friends inform their patients that their teeth are bad because of a bad stomach, we beg leave to differ with them. The stomach is bad because of the faulty condition of the mouth, which may be due to personal neglect or faulty handling of the mouth or faulty teaching on the part of the practitioner. We are, as dentists, teachers, and are supposed by the public to be familiar with cause and effect.

Can this nervousness be cured? I will answer, Yes, in most instances it can be cured by proper care of the mouth.

"White decay" in the mouth is a most dangerous factor to health, leading up to nervousness. Can white decay be controlled? Yes; but not with the usual methods employed, as the use of gold and amalgam fillings. That a large percentage of the dental profession continue to attempt to save these soft teeth by the use of gold is surely lamentable to us as we view the numerous wrecks brought to our daily notice.

We seem to find only two of the materials used that accomplish the saving results so much desired. Gutta-percha has proved a saver of teeth, but it becomes dirty and objectionable, and it is practically abandoned as a filling material. Phosphate cement has come to be recognized as a most valuable preserver of tooth-substance. The choice of a material for the protection of our cement seems to lie between gold, porcelain, and amalgam, all of which have their places. As porcelain cannot be adjusted without much cutting and mutilating of the tooth it may be said to be limited to labial cavities, and even then, with the exception of color, gold can be adjusted so much better that it is preferable, and in all approximal cavities where it is possible to make a gold filling, the combining of a cement lining, thereby making it a hygienic filling, is many times more valuable than the metal in contact with tooth-substance. To me the day is fast passing when first-class care of the mouth can be ascribed to him who lingers in the ancient custom of placing gold in contact with the tooth.

What is this proper handling? First, restore every tooth to as near its proper form as possible by excavating to solid walls—notice that I do not say healthy, for the reason that the tooth-substance is rarely free from irritation of the tubuli when decay is progressing rapidly, consequently it is not proper to call it healthy as long as there is inflammation. Having cut to solid walls, we proceed to fill, using cement in contact with the tooth—metal is too good a conductor of thermal change and too poor a tooth-saver to be allowed in conjunction with tooth-substance. After placing a cement we proceed to protect it by the use of such metal as will best suit the case, always building into the cement while soft. After filling each tooth to its full size, we then proceed to stimulate the pericemental tissues by the use of sticks and pumice, for engine work in such cases is out of the question; I never have seen the better results obtained thereby—and, as far as I know, everyone who has attained a considerable degree of proficiency in prophylaxis has come to the same conclusion.

Of late we have been confronted with the theory that it is of great importance to "blow out" the pumice after going over the mouth. I do not care to take any issue with friends on this point, for it surely will do no harm, but it is a question if it does much good. I think our colleagues would be serving their patients better if they would devote the time to a vigorous use of the stick. We are too much inclined to want to get over this service easily.

There has recently been considerable talk by many concerning the importance of chewing our food. That thorough mastication is an important factor I sincerely believe, but we must have conditions of health in the mouth at the start, or we shall find we have poisoned the food to such an extent that it will be a serious drawback. In all phases of dental service of any value their is a leading back to first causes. After we have removed this mouth-infection I will join heartily in the importance of properly masticating our food It is a plain duty on our part to first put the mouth in a good hygienic condition; then it is time to begin to talk of the proper use of the mouth. As we do this we shall soon see our patient returning to health, with sparkling eyes and glowing, rosy cheeks. What would you think of the engineer who, finding the water supply was being polluted from the streams running into it, should try to cleanse by injecting the reservoir? Would you not prefer to go back to the source of the trouble? We are not referring to the organic diseases of the stomach (which must be treated as such), but to those polluted in flowing streams.

Dr. Soulen remarks, in the *Dental Digest* for May 1905, that "One of the chief duties of the dentist is to remedy the ravages of dental decay and to use all possible means of averting it." The above is sound doctrine and worthy of full recognition, although I can hardly place as much value upon the use of syrup of hypophosphates of lime as he does in his article. He makes a splendid statement a little later in his paper when he says, "The most essential agent in the preservation of the teeth is cleanliness, for so great are the powers of the factors of decay that, unless kept clean and aseptic, the best of teeth will be likely to fall a prey to caries." While the above is excellent as far as it goes, he seems to overlook an equally valuable part in the care of the mouth, *i.e.* the stirring up of the pericemental tissues so often referred to by our friend Dr. D. D. Smith. In an article, Dr. Smith speaks of "Hypersensitive Dentin." Hypersensitiveness of dentin is the result of pericemental irritation far more than of pulp-irritation. The pericemental life of the tooth is markedly influenced by the irritative infection found always at the necks of untreated teeth. Removal of this infection is the removal of much of the cause of undue sensitiveness of dental tissue.

I con ider this a most valuable statement, and my own demonstrations have for many years proved it to be true. I believe we should give our attention more in the latter direction, and it is here that so many stumble when thinking they can do this work with the dental engine. When those who have shown their ability along this line inform their friends of the impossibility of obtaining these results with the engine, there is at once an inclination to distrust the motives; but, as far as I am aware, all who have attained a leading degree of efficiency have come to the same conclusion.

It is not my intention to go into a detailed account of the multitudes of therapeutic remedies used in the treatment of septic teeth. Many of them have some value, but the more important factor in the treatment of septic teeth is the removal of all infected matter, when Dame Nature will care for the rest. This same principle when carried to perfection is what brings such beautiful results from the general care of the mouth.

Many practitioners are advocating this and that preparation without the slightest knowlege of why they do so, except that they have been told by some commercial men that if they thoroughly prepared a tooth and used their wash they would obtain such-and-such results. Stimulated by the instructions given, they proceed to try it, and results come. Had they been as faithful in the extirpation of septic material and left the colored water in the bottle they would have had equally good results.

When we are confronted by a deep pus pocket by the side of a tooth we work perhaps many hours and then find we have left just enough foreign substance on the tooth to produce pus. Discouraged and disheartened by failure, we are wont to try some chemical dissolvent—which we have found in aromatic sulfuric acid. While it is a very unpleasant remedy to use, it seems to reach the desired end, and has been victorious in producing a healthy tissue when we failed to quite reach every point of deposit or necrosis.

The continued use of many of the preparations so vigorously pushed, or of the peroxids, will cause the enamel of the tooth to grow pitted and rough, while a similar use of phénol-sodique (which is both antiseptic and germicidal) will stimulate the enamel to a hardening with a bright and glossy surface which we see only in cases treated by the said stimulant.

The one thing most needed today is not therapeutics, but more faithfulness in obtaining results by the common-sense methods of surgically dethroning decay and all irritating or septic matter in the human mouth.

GOLD AS A FILLING MATERIAL.

By **Dr. J. V. CONZETT, Dubuque, Iowa.**

(Read before Section II of the National Dental Association, Buffalo, July 25, 1905.)

GOLD when properly manipulated still maintains its pre-eminence as a filling material. I say, when properly manipulated, for a gold filling that is not well made and that does not hermetically seal the cavity is a poorer filling than one that is made from any of the plastics. While it is true that a good gold filling is the most permanent one that we have, it is equally true that a poor gold filling is the most ephemeral one, when judged from the standpoint of its preservation of tooth-structure. For a gold filling that is not well made allows the fluids of the mouth to penetrate between it and the dentin, and the process of decay immediately begins. Therefore, it behooves us as dentists, if we wish to use gold, to study its peculiarities and to know how to use it. For the better we become acquainted with it the more will we appreciate its qualities and use it where permanent results are desirable.

There are many forms of gold that are used today for filling teeth, and all of the various preparations have their good qualities. We have the foils both cohesive and non-cohesive, the various cylinders made from the foils, and many crystal and mat forms. Each of these preparations has its advocates, and in the hands of experts all give excellent results. However, after having tried all of the different preparations I have discarded them, and for some years have used only the foil prepared in the manner which I shall describe later.

It will not be possible for me to outline the method of cavity preparation in the time that is allotted to me. I can only say that this phase of the work is, of course, of the greatest importance. For a filling that is made never so well cannot be a success in an improperly shaped and prepared cavity. I follow the methods of cavity preparation as taught by Drs. Black and Wedelstaedt, and having prepared the cavity as I deem proper by my study of the condition of the tooth and its environment, I am ready to introduce my gold.

Three objections have been urged against gold as a filling material: its color, high thermal conductivity, and difficulty of manipulation. These objections are all valid and yet in some positions can be entirely and in other places partly overcome. Its color is objectionable in conspicuous cavities and cannot be overcome, but in places not too conspicuous its color is not bad, for it does not darken or discolor the tooth; its thermal conductivity can be very largely modified by varnishing the cavity, and the difficulties of its manipulation can be overcome by an intelligent study of its properties, its physical characteristics and peculiarities.

Gold foil is naturally cohesive when perfectly pure, and all pure gold is cohesive. If an impurity of any description be deposited upon the surface of the foil, it loses its cohesiveness. In preparing the non-cohesive foil, a film of gas is deposited upon the surface of the foil. If this gas be one that is easily driven off by heat, as ammonia, the foil immediately regains its cohesiveness upon being annealed. If, however, the gas deposited be one that cannot be driven off by heat, as carbon dioxid, the result is a foil that is permanently non-cohesive and that cannot be made cohesive by annealing. Inasmuch, therefore, as there are impurities in the air about us, and especially in our operating-rooms and around our cabinets, it is well to protect the surface of our foil from possible contamination by agents that cannot be easily removed. Dr. Black advises doing this by keeping in the gold box an open dish of ammonia, the gas of which will be deposited upon the gold, protecting its surface from contamination by any other agent; and then, immediately before using, anneal the foil, driving off the film of ammonia, when a perfectly pure and cohesive surface will be secured.

Nearly all of the non-cohesive, or so-called "soft" foil comes with an ammonia-protected surface, so that if those foils are used it is only necessary to carefully protect the gold, and not allow it to become too old before using.

We prepare the foil that we expect to use as cohesive gold, in pellets of $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$, and $\frac{1}{64}$ of a sheet. In doing this we take a sheet of foil and divide it into the proper number of squares, then folding the corners in toward the center, fold the square into a pellet. We do this that we may know definitely just exactly the amount of gold that we are using when we pick up a pellet of gold. We believe that definite methods produce definite results, and, as the force and number of blows of the mallet that are necessary to condense a given piece of gold has been worked out in the laboratory, we know when we place a $\frac{1}{32}$ of a sheet pellet, for instance, upon a filling, the number of blows of the mallet required to condense that piece.

The filling is started with a $\frac{1}{64}$ pellet tucked into the linguo-gingival-axial angle, as a rule, and malleted carefully to place, always malleting from the center toward the walls of the cavity. We use the hand mallet because we believe that it gives us the best results. Dr. Black, in the DENTAL COSMOS for September 1895, gives us a series of tests that he made with different mallets. Fillings were made by many operators with mallets of various kinds, and the result was vastly in favor of the hand mallet when used with considerable force. Next came the automatic mallet, and last and very far in the rear came the electric engine, and mallets of the woodpecker species in general. I know that certain operators claim that they can make dense fillings with these mallets, and I have no desire to dispute any assertion that they may make on that score. I only wish to say and to say it with emphasis, that I cannot—and I know, for I have tried it. I used the electric mallet for two years and I do not need to go to my records to tell me when and how one of those fillings was made, when a patient presents one for inspection. It bears the pits upon its face. The fillings that I made with the electric mallet have caused me more grief and humiliation than all of my other operations put together. So we use the hand mallet in the hands of a trained assistant. We do it because we can make better operations and make them much quicker.

The filling is built up piece by piece, always malleting from the center of the cavity toward the walls, thereby causing the gold to be driven or "flowed" toward the walls, making a moisture-proof joint. Never under any circumstance should the point of the plugger travel away from the walls of the cavity. The last blow upon a given pellet should be the one that sends it snugly against the wall. We know that malleting or pounding gold tempers it and makes it hard and springy. Therefore if we mallet the piece against the wall first and then toward the center, we will have made the piece hard and it will draw away from the wall of the cavity as our plugger point travels toward the center, and all of our malleting afterward in order to drive it to place will be in vain, and we will have an imperfect place in our filling.

Then, again, the plugger point should be used in a definite and intelligent manner, not here and there haphazard. Beginning in the center of the cavity the plugger should be stepped in an orderly sequence of steps from the center toward the walls of the cavity until the whole pellet shall have been thoroughly condensed. We insist upon holding the plugger point firmly upon the gold, using considerable hand pressure in addition to the mallet force, for if the plugger is held away from the filling the greater part of the force of the blow of the mallet is dissipated in driving the plugger point down to the gold, and the gold is not properly condensed. A perfect gold filling should very closely approximate cast gold in density. It should have a density of from 19 to 19.2 specific gravity. In order to most closely approximate such density it has been demonstrated by laboratory experiments that it requires twenty blows of the mallet for a $\frac{1}{64}$ of a sheet of foil, forty blows for a $\frac{1}{32}$, eighty for a $\frac{1}{16}$, etc. The force of the blow must, of course, be regulated by the size of the plugger point, as the force of the blow to produce the same result must increase according to the square of the diameter of the plugger point. It is obvious, too, that a small plugger point is therefore advisable. We never attempt to adapt our gold to a polished enamel margin, for we know that it is almost if not quite impossible to adapt cohesive gold to a polished surface. Perhaps every man in the Black and Wedelstaedt clubs has tried the experiment, and not one has been able to do it; perhaps others can—that remains to be demonstrated. But we do know that we can adapt the gold to a planed surface, therefore we do not polish our cavity margins with sandpaper disks, etc., but plane them with sharp chisels and hoe-shaped excavators.

The operators of the old days knew nothing about cohesive gold, and yet they made some very beautiful and lasting fillings. With the advent of cohesive foil, however, the profession, in its delight with the new, forgot the good qualities of the old, and the use of non-cohesive foil passed into desuetude. We are beginning to appreciate the fact that that was a mistake, and at the present time we are combining the two, using the good qualities of both, and eliminating as much as possible their bad qualities. In cavities in the approximo-occlusal surfaces of bicuspids and molars this method saves time, energy, and nerves.

The non-cohesive or unannealed foil is prepared by cutting a sheet into halves and quarters. These are then folded into ribbons of varying widths, and these are in turn rolled into cylinders upon a Swiss broach, a hatpin, or other suitable instrument. In using them for instance, in a cavity in the mesio-occlusal surface of a molar, a quarter cylinder is placed in the linguo-gingival angle, and one in the bucco-gingival angle, and these are keyed to position by placing one or more half-sheet cylinders between them on the gingival seat and then strongly condensing them with hand pressure, which may be followed by mallet force if desired. After this we commence with our cohesive foil, anchoring it in the step in the occlusal surface and building the gold forward and over the unannealed foil in the gingival third of the cavity, effectually locking it into place. By using this method we not only gain a better adaptation at the most difficult point of our cavity, the gingival seat, but we reduce the time of the operation very materially. Another place in which we use the non-cohesive cylinders is in cavities in the occlusal surfaces of molars. The cylinders are placed on end against the pulpal wall of the cavity and wedged to place until there is but a small space left in the center of the cavity that is not filled. In this we now place small pellets of cohesive foil until the cavity is entirely filled, and then condense the whole filling thoroughly.

I have of necessity hurried over the points in this paper. I was warned not to exceed two thousand words, and I fear that I have already done that. But those that are interested in the methods that have been taught by Dr. Black and Dr. Wedelstaedt can receive more than I can possibly give in a paper, by watching the operations that will be made by the men of the Black and Wedelstaedt clubs.

As for me, I wish to say that I struggled with old methods and new methods. I tried all forms of gold and all forms of mallets, only to sink deeper and deeper into the slough of despond. But since adopting the methods which we men of the Northwest are so enthusiastically advocating, my operations in gold are my pride and my delight, and the failures are few and far between, and cases that do fail are those that have not been carried out with sufficient accuracy.

THE POSITION OF DENTISTRY IN THE FIELD OF MEDICINE.

By VAL. MACDONALD, D.D.S.Univ.Pa., L.R.C.S.Edin., Brisbane, Queensland, Australia.

FROM times far more ancient even than those in which the blacksmith with his rasp and pliers constituted the dentist and his equipment, the seeds of progress in the dental art were sown, but struggled hard for existence on more or less barren soil. In more modern times —with the soil fertilized by scientific research and watered from the wells of knowledge—progress has been so marked that even the medical profession is gladly extending the hand of welcome. On all sides we hear it said, "There is no doubt that every dentist will soon have to take a special course in medicine." More than that; medicine must soon recognize in dentistry a missing limb without which its organism is incomplete. So that equally should it be said, "There is no doubt every medical graduate should have a special knowledge of dentistry."

This progress is the more extraordinary in that so much of it has been without any assistance from that medical profession which is now ready to claim dentistry as a sort of prodigal son. Strength also was gathered from this progress in the fight to overcome the long and strenuous opposition of the social world, for to that world the dentist was just such an outcast as was the barber-apothecary of other days, and perhaps no less dreaded than the wizard, in whom we of modern times would recognize an Edison or other scientist. Knowledge has been systematized in each and all of the separate paths until they have met in one great field of science, to develop further by united rather than by individual effort. The stud of bacteria and their products has done much to reclaim dentistry as a special branch of medicine and to teach how much one is dependent upon the other. So it is that dentistry is fast reaching a stage of development in which it may claim as its special care not only "the oral cavity and all that in it is," but beyond that, the special phases of disease that finds its origin directly or indirectly in the oral cavity. Surely in a field so well developed it behooves the medical profession generally to seek to embrace the knowledge therein rather than to continue longer to gaze upon dentistry much as does the average tourist in viewing some noble structure without any desire to closely study its more hidden architectural beauties. Day after day even in this age of enlightenment the scarred cheek tells a tale of woe for the patient and the sad ignorance of the average medical practitioner who relieves an alveolar abscess by poulticing the cheek, neglectful of the fact that he is but determining an unsurgical path of least resistance, and only awakening to the fact when the beauty of a face is ruined.

Still more important is the want of appreciation of the reflex disturbances having undoubted origin in the oral cavity. The infant cutting its teeth with difficulty and without the judicious assistance of the lancet is often the victim of a nerve or digestive storm too seldom realized until the delicate human organism is wrecked beyond repair. Too often one hears the remark that "the gum tissue is not so sensitive as all that." Dentists have long recognized that the gum tissue, though itself sufficient to cause much trouble, simply determines in these cases an amount of back pressure upon a sensitive pulp which must be exquisitely painful. It is not too much to say that many an attack of convulsions could be warded off and many an infant life saved by the judicious and timely use of a little cold steel.

I believe the necessity for keeping the infant's mouth clean is sufficiently recognized not to need further mention.

In neuralgia, so called, I am firmly of opinion that in ninety per cent. of cases the cause is to be found in tooth-trouble of some kind.

An appreciation of reflex disturbances likely to result in the case of a delicate infant cutting a tooth difficult of eruption should be easy for the average medical man, who has to deal so greatly with what are often extraordinary reflex troubles due to other causes. To illustrate this point I might refer to the almost anciently recognized reflex disturbances due to intestinal parasites or worms. Again, to the nasal reflex origin of many cases of asthma as shown by Dr. H. V. Francis of London, and again to the extraordinary relief recorded by Dr. W. N. Robinson of Brisbane and Dr. H. V. Francis of London in cases of angina pectoris by cauterizing particular portions of the nasal passages. The act of sneezing on passing from a room into bright sunshine is still another reflex action further illustrating this point. And so we could wander on, gathering point after point from the storehouse of dental knowledge, and dwell upon its practical application to medicine as a whole.

But it is not alone in such conditions as above discussed that the medical world may find the ideas of the dental brethren worthy of consideration. Dentistry demands from its disciples a certain mechanical aptitude that has led to rapid progress in perfecting instruments and appliances necessary for its purpose. In its professional infancy hand instruments alone were used in dental practice, and rough ones at that, for the purpose of filling and thereby saving the teeth. But many cavities were inaccessible to such methods and the key or forceps claimed a victim. But the tide of progress had begun, and soon the dental engine was established. Rough and clumsy now does that early effort seem; but it contained the germ of a new idea which has now grown to adult life in the beautiful cord engine with its electric motor. But while the dental engine was growing, so too was the field of dentistry, and the oral surgeon was evolved, and with his evolution came the need for still another engine for work more strictly surgical. To Drs. Bonwill and Cryer the surgical world now owes a vote of thanks for the result of their efforts—the fine engine turned out by the S. S. White Dental Manufacturing Company.

Now for a moment let us turn to surgery and compare its progress. In every direction the progress of surgery has been remarkable—anesthesia, asepsis, new methods, knowledge of anatomy, instruments, all spelling progress—until pain and sepsis have almost vanished from our wards. And still the cry is ever forward. But in all this progress it is little short of extraordinary to find how conservative the surgeons have been in regard to instruments. True there have been changes, great and innumerable, but always the same hand instruments or methods as of yore. Occasionally one sees the dental engine used for mastoid work, but how many surgeons today use the surgical engine in general bone surgery? There seems to be a natural prejudice among surgeons against the use of an engine which at first sight may savor of the saw-mill with the patient as the log. But do we sufficiently pause to think how much better and quicker served would be that same "log," where time so often means life? Day in, day out, we plod along in old grooves formed for times more ancient than the present.

A sequestrum is to be removed: A chisel is chosen, and a mallet of uncertain weight and directed with uncertain force is banged blow after blow for long and tedious moments until an untidy operation is at length considered complete, and without accident.

Again, the patella is to be drilled for wiring, and we are warned of the danger of splitting it still further in the operation.

In another case the skull needs opening: A trephine is chosen, and again with uncertain pressure and a waste of precious moments the result is accomplished, with or without injury to the membranes.

Still again, the maxilla is to be removed, and after much careful dissecting and sawing, lion forceps complete the operation much as a wild beast might crunch its victim's skull.

With the dental or surgical engine how different might all this be! Seldom, if ever, is the general surgeon called upon to develop the delicate sense of touch so necessary to the dentist. Cutting has frequently to be done within the very shadow of the pulp, and the dentist does not choose an uncertain hand instrument, but the trusty engine which with his electric motor he holds in perfect control, and with the lessened pressure required his sense of touch is infinitely superior to that obtained in using a hand instrument.

In the sequestrum case the work would not only be well and cleanly done but the surgeon would possess a full knowledge of what he actually was doing. In the case of the patella there would be absolutely no danger of splitting the bone in drilling within an ace of the edge or at any angle. With the skull the sense of touch would alone be perhaps sufficient guide as to the thickness of the tables, but with the use of the guarded spiral osteotome devised by Dr. Cryer it is almost impossible to injure the membranes, while the speed is considerably greater than with the now ancient hand trephine. Lastly, in the case of the maxilla the bone is rapidly cut with a minimum of shock, and ragged edges and splintered bone avoided. In a word, the operation is indeed an operation and not the ghastly performance it too often is.

These are but a few illustrations of much that might be done with such an instrument in general use. The handpiece of the engine may be easily sterilized, and sterilized oil used as a lubricant.

I have endeavored to show how in the field of medical science there is no separate tree of knowledge for each path leading to that field, but that the tree grows right at the center. By plucking the fruit from certain branches alone we are apt to break its boughs, and distort its development, but the tree will surely prosper and bear good fruit when all branches of the healing art are cultivated in unison and harmony and with a right good will.

AN EASILY CONSTRUCTED PORCELAIN CROWN FOR MOLARS.

By N. A. STANLEY, D.M.D., New Bedford, Mass.

(Clinic—Massachusetts Dental Society, Boston, June 7, 1905.)

IN giving a description of the different steps incident to the construction of this crown, I do not pretend to describe anything new or original. I first used it for broken down molars the seat of abscesses, which after being properly treated make solid foundations for crowns.

Of course the first step is to carefully treat the roots, then fill the pulp-chamber, restoring any decayed portion with amalgam. When nicely finished below the gum line there will be nothing to irritate the tissues, one of the essential requirements in all crown work. After the amalgam has hardened and been trimmed even with or a little below the gum line, proceed as follows: Drill two or three parallel holes, wherever best to do so, an eighth of an inch or so in depth, large enough to receive No. 18 gage platinum wires. To this surface burnish a piece of platinum plate of No. 32 or 33 gage. The pressure of a small ball burnisher will indicate the position of the holes. Put the wires through the plate and solder them with pure gold. I usually solder one at a time, and it assists in obtaining accurate relationship of the wires and holes.

The length of the pins on the occlusal side will be determined by the nature of the bite.

FIG. 1.

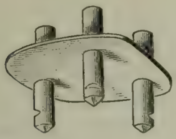


FIG. 2.

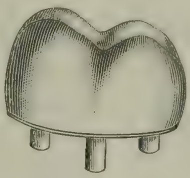
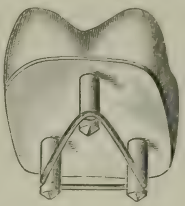


FIG. 3.



After the pins are in position further burnishing and malleting will indicate the exact size of root-surface on the under side of the platinum. Trim accurately to this line and bring to a knife edge (Fig. 1). Place in position and take an impression and bite at the same time with plaster. From this impression accurate working models are obtained. A thin coating of wax on the pins enables one to remove them from the model easily. The body is now applied and biscuited, and after it has been carved to more accurate proportions is ready for the enameling (Fig. 2), although before doing this it is well to wind a piece of small platinum wire around the ends of the pins (Fig. 3), as in baking the contraction of the body will cause these ends to spread. Pure platinum should be used, as the pins can be readily bent if necessary. The little wire will prevent much change. As there is considerable shrinkage it may be necessary to add a little body or enamel several times before a perfect result is obtained.

My experience for crown work has been confined to Parker's high-fusing body, whenever I have done my own carving. I have no doubt, however, that the different makes are all good for this work.

PROCEEDINGS OF SOCIETIES.

PENNSYLVANIA STATE DENTAL SOCIETY.

Thirty-seventh Annual Meeting.

(Continued from page 52.)

THE President announced as the next order of business the reading of a paper by Dr. H. W. ARTHUR, Pittsburg, on "Readily-Made Matrices and Their Application."

[This paper was printed in the January issue of the COSMOS, at page 35.]

Discussion.

Dr. H. C. REGISTER, Philadelphia. The term matrix is derived from the Latin word *mater,* which signifies mother. In mechanics it means a mold, or anything which gives form or shape. For its application to dental practice we are indebted to Dr. Louis Jack. I have listened with great pleasure to Dr. Arthur's paper, and it is a realization of some of my own efforts to see a man who is so careful and who does his work so thoroughly as Dr. Arthur does with this appliance which he terms the slip matrix—a forerunner of something better. I call it the individual matrix, because it is made for the individual case.

It is with hesitancy that I criticize Dr. Arthur's paper, because he is such a good practitioner and I have such a high regard for him personally that I hesitate to antagonize anything he says or does, but the paper to my mind presents nothing new. This subject has been fully gone over a number of times not only by myself but by others, and while it presents some good points, there are other things better for our work. Comparatively speaking, the method is obsolete. The material, steel or German silver, that he uses for the slip matrix, I discarded, after considerable experimentation, for planished or rolled copper, No. 36 to 40 gage, which possesses all the good qualities to which Dr. Arthur calls attention, with the additional convenience of being a material that is absolutely controllable, using the silk ligature when necessary.

There are many operators who learn to use the matrix and there are many who do not. Now, there is a conflict of opinion existing between men who will not use the matrix and those who use it altogether. The original matrix was a very arbitrary arrangement, and as used today separation of the teeth is necessary to its successful employment. The individual matrix of thin copper can be slipped into position without previous separation, doing away with that disadvantageous and painful part of the work. A thin steel matrix can also be slipped in, but the ligating or wrapping makes the copper better. The copper matrix is made from a planished or rolled slip cut into the various forms to make a negative in affirmation of a perfect restoration requiring the least amount of final finish. To keep the ligature from slipping under the gum, turn up the corners slightly; this, however, is only required in exceptional cases. The matrix wrapped in position in every part of the tooth with the silk ligature enables us to produce the contour form of the teeth and the interproximal spaces; the knuckling is perfect and the gingival border normal.

Dr. J. A. WOODWARD, Philadelphia. There has not been a matrix brought forward that has not had some merit and degree of usefulness in it. The matrix of Dr. Arthur appeals to me for the reason that it requires but one interdental space. The method of retention has been abandoned except in very rare conditions; small screws of not too coarse thread have proved to be as efficient and much more convenient. By practice Dr. Arthur would probably form and fit his matrix in very little time; however that may be, my preference has been for a matrix which can be applied at once. For gold fillings in the approximal surfaces of the molars and bicuspids, especially where the cavity has been much extended for prevention, the matrix has been of the greatest service to me. Should the matrix fit closely or not depends upon the conditions to be met. For gold I prefer it to be a little free of all the margins of the cavity; for amalgam, gutta-percha, and the cements, a closer fit is better. For the material of the matrix my preference is for steel of different thicknesses to meet the various conditions, such as restoration of contact and contour. The mechanics of the matrix is so very plain and aids so much in the exact placing and condensation of the different filling materials, especially anything of a plastic nature, that I do not understand why any operator should not profit by their use.

Dr. J. A. LIBBEY, Pittsburg. This paper is so very clear and so plain that it does not seem to me to need much discussing. Dr. Arthur's paper as I understood it was a very clear and plain description of the right method of making matrices, and I was a little surprised at Dr. Register's being so severe on him, for as between the two suggestions made I would criticize that of Dr. Register rather more than I would that of the essayist. I consider that the matrix he has shown here is for many cases and for the average practitioner in applying it much simpler and better than Dr. Register's method. Of course we all know that Dr. Register is an inventor and does not like to use anything but his own individual invention, which for that reason is to him better than others.

Dr. REGISTER. I use everything that is good.

Dr. LIBBEY. I would like to add just a few observations on this matrix which Dr. Arthur has presented. You will find that the use of this matrix will work wonders. Merely the perforation of the holes is a great advantage to it. Dr. Woodward spoke of his fear of the wedge slipping. As Dr. Arthur said in the paper, we should use the wedge coated with sandarac varnish, and with this it is almost impossible for the wedge to slip. Another point Dr. Register made that surprised me was his advocating the tying of the matrix with a ligature. With a good hard wedge at the neck of the tooth it is certainly much easier to retain and firmer, than by tying the matrix with the ligature.

Dr. REGISTER. I would explain with regard to the adaptation of the copper matrix with the ligature: It is wrapped, not simply tied; every part of the matrix is brought into juxtaposition, presenting a perfect mold for reproduction. When Dr. Libbey says that the matrix cannot be held in perfect position by the ligature, it surely must be because it fails to wrap it from the neck to knuckling contact, or does it backward. Certainly there is no place in the mouth where the matrix with the ligature cannot be applied effectually. In cavities extending below the gum the individual copper matrix can be made to adapt itself just as perfectly with the ligature—the added wedge of zinc oxyphosphate being carried down into position filling the space during the operation. The copper should be very carefully annealed before it is used. Cooling it in alcohol gives the copper a beautifully clean surface with a lead-like consistence. This matrix, with which I have had so much experience in its many forms, enables us to perform operations that absolutely restore normality to tooth and gums. When being placed in position there need be no previous separation. The ligatures are cut and drawn out sideways, and the matrix is also broken at the knuckling contact and taken out sideways. The exposure of the one tooth inclosed in the dam is sufficient; the clamp catching on the wrapping of silk ligature never impinges upon the gum. These are some of my conclusions reached by going over the same ground that my esteemed friend Dr. Arthur is now traveling.

Dr. OTTO E. INGLIS, Philadelphia. I think the method Dr. Register uses cannot possibly result in a full contour of the tooth except with gold. He speaks of contouring without gaining space. Now, unless he gains space, when he removes the matrix from around the amalgam he has at least the thickness of the matrix lacking in the contour of the filling. To overcome that difficulty we may make what may be termed a half-matrix—that is, do not have it extend entirely from the cervical margin to the occlusal surface, but only half-way up, and beveled outward at the point of contact with the adjoining tooth. For inclosing the filling above the edge of the matrix the fingers and the adjoining tooth may be used. After the matrix is withdrawn the amalgam may be rounded up to the contact point of the filling which is left against the adjoining tooth. The smoothness of this tooth makes necessary only the polishing of the edges of the contact point and a slight rubbing of the contact point with floss and polishing material.

Dr. ARTHUR (closing the discussion). The method of applying a matrix advocated by Dr. Register is ingenious. By means of a ligature he secures exact adaptation to the buccal and lingual, as well as at the cervical margin of the cavity. Apart from the difficulty—it would seem so to me, not having tried it—of wrapping the ligature, I do not see the necessity for this exact adaptation other than at the cervical third, for the reason stated in my paper.

The point has been made that there is a liability of the matrix impinging on the gum. Not if it be applied as stated in the paper—at least not to produce inconvenience or do harm. The matrix can be removed by opening the extensions, buccal and lingual, and drawing it out by the aid of the holes. The thickness of the matrix will not prevent absolute approximal contact, if the filling material has been introduced as indicated in the paper. This, indeed, is one of the strong points. I would finish the cervical third before trimming to approximal contact. A thin Gordon White saw may be passed between the teeth and still have full approximal contact.

On motion the subject of Dr. Arthur's paper was passed, and the meeting adjourned until 2 o'clock in the afternoon.

WEDNESDAY—*Afternoon Session.*

The meeting was called to order Wednesday afternoon, June 28th, at 2.30 o'clock, by the president, Dr. I. N. Broomell.

The reading of the minutes of the morning session were dispensed with, and the President announced that owing to the limited time for the afternoon session he would pass immediately to the reading of the paper of Dr. Bethel.

He then called on Dr. L. P. BETHEL, Columbus, Ohio, to read his paper entitled "A Few Observations," as follows:

A FEW OBSERVATIONS.

One of the grandest of laws is the law of progressive development. Under it, in the wide sweep of things, men grow wiser as they grow older, and societies better.

Dentistry has advanced under this law, and while it is not perhaps receiving the full recognition it deserves, it stands today a living monument unobscured by older professions.

Yet it is not altogether where we stand, but as well the direction in which we are moving that concerns us.

Are we doing all that can be done in this day and generation for the continued upbuilding of dentistry.

Dental societies are the fraternizers of the dental profession, and where there is free interchange of thought the mind acquires new ideas, and by a frequent exercise of its powers the understanding gains fresh vigor. Dental societies should be encouraged and memberships increased.

INCREASING MEMBERSHIPS.

In Ohio a year ago there were enrolled, through the efforts of active committees, seventy-four new members in the state society and sixty-six in the Northern Ohio Dental Society. This year there were added to the state society sixty-nine new members and to the Northern Ohio forty-six. Last year Indiana added about seventy new members to her state society.

These results were looked upon as record-breakers by the society members, but they fall into insignificance when compared with what Illinois has just accomplished through thorough reorganization and combined effort. The Illinois State Dental Society last year could boast of only 274 paid memberships; this year the enrollment shows 1195. An increase of 921 members in a single year seems phenomenal. Could their plan be adopted by all state societies, and as successfully carried out, who can estimate the benefit the profession would derive?

The plan is on lines similar to those carried out by the Illinois State Medical Society, and briefly stated is as follows: All existing local societies and any additional local societies organized are made component parts of the state society. As each county or district is organized, the state society recognizes the county society as its representative, and a practitioner can become a member of the state society only by being elected a member of a county society. All members of the county organizations become members of the state society. Each member of the county societies pays dues covering the membership of both the county and state societies to the county society, and the secretary of each county society forwards to the secretary of the state society the state society's share of the dues paid by each member.

By this plan the men of each county organization pass on the qualifications of applicants to both their own and the state society, and if at any time a man is dropped from membership by his county society he is at the same time dropped from the state society.

Under this plan the Illinois State Medical Society now has five thousand members out of eleven thousand practitioners in the state.

KEEP BUSINESS OUT OF THE SOCIETY.

Every society seems to recognize the necessity of an attractive program and instructive essays and clinics to make its meetings profitable and to call out a large attendance.

Routine business should be as far as possible eliminated from the general meeting, as it detracts from its interest in proportion to the time consumed by it. At our state and Northern Ohio societies, matters of business are referred to a board of directors.

The election of officers and new members is about the only business brought before the general assembly unless it be something of special importance.

Now just a word about the election of new members: In the Northern Ohio Dental Society candidates for membership are recommended by two members and referred to a committee to investigate the candidates, and if the committee is satisfied the names of the applicants are written on a large blackboard so that all members can see them. They are thus left through one session of the meeting. If any member has objections to any applicant it is his duty to report to the committee, who then withhold the name pending further investigation; if there are no objections the society votes on all candidates at once, which requires but a few minutes of the society's time. In the state society candidates are referred to the board of directors, who investigate them and recommend to the society for final vote. In both instances it takes the responsibility from the board of directors having the deciding voice.

Take business out of society meetings and nothing remains to detract from the interest of its sessions.

MAKING HISTORY—INDIVIDUAL RECORDS.

Someone has said that "The history of a nation is to be found in the biographies of its great men." This ought to apply equally well to dentistry, and the dental society could contribute bountifully to the history of dentistry were more complete records kept of individual work on the part of its members.

About seven years ago Dr. Henry Barnes, Cleveland, conceived the idea of keeping individual records in the dental societies and formulated a book for this purpose. Of these he had three printed and presented one each to the Cleveland City Dental Society, the Northern Ohio Dental Society, and the Ohio State Dental Society. In these societies the records are being kept up and will make invaluable material for the historian or biographer of the future.

A brief description of the book is as follows: In the first column is a space for the name of the member, address, date, college from which he graduated, titles, dental societies of which he is a member, and a blank signifying expelled, withdrawn, died. The next column remains for notation of offices this member holds or has held in the society, with date, committees on which he has served, etc. In the next column is recorded, by title, the papers, clinics, etc., presented to the society by this member, and the date thereof. The next column is left for remarks or facts regarding what this member has done for the good of the profession other than those things recorded in the other columns. Through diligent search quite a complete record, from the time of organization of each society, was compiled from dental journals and society proceedings.

These records show just what each member has done and is doing in the society, and stand as a permanent historical index to the work of the organization. If every society would keep such a record it would be of inestimable value to dentistry.

RESEARCH WORK.

Dentistry offers a fruitful field for research and there is an opportunity for those inclined. I say "those inclined," for a man must have a natural inclination for such work to obtain the most complete results—a natural inclination and curiosity to know the truth, and a willingness to sacrifice both time and expense for investigation. This has been a characteristic of our prominent investigators.

Some time since, through curiosity, I inquired of several of our most prominent researchers if they had any idea of how much money, approximately, their original investigations for the good of dentistry had cost them. Pardon me if I quote briefly from some of the replies:

One writes: "I have spent, I think, quite a considerable amount of money in trying to find out things, but whether it was for the good of the profession or myself I never have been quite sure. It seems to me that it has been largely spent to gratify a natural curiosity, and suspecting that to be the case, I have never kept any account of it. If I had had no curiosity, I might have been able to retire by this time, or much earlier. Such research work as I have done was undertaken and carried out because I wanted to know the reason why, and after I found it out, or thought I had found it out, I have usually told it to the dental profession. I have been satisfied with the belief that in securing a knowledge of the reason why, I have received full compensation for any outlay required to achieve that end. What the dental profession thinks about it, and especially whether they regard such work as done for them or as being of benefit to them, I do not know. They never told me."

Another says: "It would be about as difficult for me to tell how much money I had expended in research work in dentistry as to tell how many blackbirds I have seen in a flock. I only know there were lots of blackbirds, and this research work has cost me lots of money. I can think of instances where two or three or even four hundred dollars have gone in a lump, but the larger part has gone in smaller sums, and it is impossible for me to give any very accurate idea."

Another writes: "I have at the present time a certain amount of help in my original research through the Dental Institute, in which I have a laboratory free of rent and my current expenses for the most part paid. Nevetheless I still pay out of my own pocket something like eight hundred dollars a year, to which should be added the expenses of attending various dental meetings, which in the last year ran close to five hundred more. Indirectly my expenses have of course been very heavy, and if the time I have used up in original research had been employed in the practice of dentistry it would have meant ten thousand dollars a year to me. Two years ago I gave up my private practice altogether in order to get more time for original research and for my work at the Dental Institute. I should now like to give up the latter and devote all of my time to laboratory work, and am only waiting for Carnegie or some other well-disposed man to endow a laboratory for this purpose."

Another says that research work has cost him in money and time approximately forty thousand dollars.

Another writes that his research work has cost him from ten thousand to twelve thousand dollars, and adds: "The most expensive experiment of all has been to attempt to interest the profession to accept the truth of the experimental work made. This has cost me between twenty-five thousand and thirty thousand dollars, and it has taught me one lesson, and I regret exceedingly to say it has taken many years to impress this fact on my mind—that the vast majority of the men in the dental profession were more greatly interested in the almighty dollar than they were in the salvation of the human teeth."

I presume these men will not thank me for speaking of this phase of the subject for I know each and every one feels amply repaid for all monetary outlay through the satisfaction derived from results obtained, but the profession ought to realize more fully what these men have in every way sacrificed in finding out things that will stand as guide-boards on the road of dental progress.

Our researchers have sown the seeds of a new degree of dental progress in the profession, but, alas! too many bear fruit only after many years. The profession as a whole does not seem to be as appreciative as it should of the work that is the unfolding of useful knowledge destined to mark an era in our advancement. We need more researchers, but there seems to be little encouragement outside of a feeling of self-gratification.

APPRECIATION.

There should come from the profession an appreciation for any research work done that deserves it. An appreciative word oftentimes encourages a man to redouble his energies. In referring recently to this subject of appreciation, a friend of mine remarked that "What the dental profession needs now more than anything else is twenty-five reformers who have an unusually good interpretation of the fundamental principles, who are honest, upright men, to reiterate continually the necessity for making use of the newer knowledge which experimental research has proved to be of value in prolonging the usefulness of the human teeth—men who can impress upon the minds of others that to do good and to be kind, as well as to be of some worth in the world's affairs, is all that there is to life, the almighty dollar to the contrary notwithstanding."

Another friend remarked: "Sometimes I think our profession is forgetful of that kind of reward which costs nothing and is a blessing both to giver and recipient. I think this when I remember S. C. Barnum and the rubber dam. and Horace Wells, and a host of other men who have done good for dentistry and whose names are almost forgotten. What class of students today could tell you who invented the rubber dam? How many know the name of the discoverer of anesthesia? Let us accumulate a fund of gratitude and dispense it occasionally among the benefactors of our profession."

UNITY.

To accomplish most and to advance rapidly there must be united effort.

"In unity there is strength." And if the members of the dental profession would lay aside petty jealousies, personal differences, etc., and work together for the advancement of dentistry, each member willing to do his part, there would be an awakening that would surprise us.

We should have a desire to see dentistry develop, but also with watchful care see that it continues in the right line. So, let us labor for that larger comprehension of truth and that more thorough repudiation of error which shall make the history of dentistry a series of successful developments.

Discussion.

Dr. JAMES TRUMAN, Philadelphia. The essayist has spoken in regard to the number of members that can possibly be secured with a certain amount of effort. I cannot quite agree with the idea that numbers are vastly important; quality is of far more importance in my estimation. We have some twenty-five thousand members of our profession in the United States, and how many of that number are members of societies? If we want to do real genuine work, numbers, according to my estimation, are rather a detriment than otherwise. Some years ago, when I was president of the American Dental Association, I called attention to my idea of what should constitute membership in the different societies, beginning with the local societies; that the man who wanted to become a member of a state society should be sent there because of some good work that he had accomplished in the local society, and when he had reached the state society he should not be advanced into the National until he had brought forth something original for his profession, and when he had reached the National he would by that time be able to properly do research work.

Now, I know that this will be regarded as utopian; but, after all, is it not true that numbers rather harass our work than advance it? The true workers in our profession can be numbered today almost on the two hands, but the rest it seems to me are not perfectly willing to accept and receive that labor, and many perhaps may not even be able or willing to absorb it.

What we want in the profession more than numbers is willingness to receive and willingness to read. Our profession is not a reading profession; I think we will almost all acknowledge that. Men take the journals—trade journals and other journals—and they are piled up on their tables; and it would be of value to know how many of the profession are familiar with their contents. I am very well aware that dentistry is one of the most laborious professions, and when a man reaches the end of the day he is not fit for hard literary work. But herein I think the profession makes the great mistake of keeping at work from early in the morning until sometimes ten o'clock at night. We should regulate our time, and those that want to live and be of use to their profession and families must take that time daily regardless of the *clientèle* which they have in charge. I always think of Dr. William H. Trueman in this connection. He always takes one day off in the week, no matter how busy he may be, to get that mental refreshment that every individual needs.

Now, the essayist touches on research work, and instances one individual in the profession who has spent forty thousand dollars in original work. I did not suppose that there was one man in the dental profession who could afford to spend half that amount for any kind of work at all. We are supposed to be a poor profession, and I am therefore pleased to know that there is in it one man who is able to live and spend forty thousand dollars. But where is the result? It should be manifest somewhere. Now the individual who has spent forty, or ten, or five thousand dollars in the course of research work, what does he do it for? Is it not the natural gratification of the disposition in that individual to find out the truth? I have done some research work in my life, but I never thought particularly of the profession; I never thought of the money expended, but I did feel that I was searching for the truth. And I believe that every man who undertakes a work of that kind should do so not with the idea of compensation, or whether it helps his reputation throughout the world, but to feel that it makes him a better man in his profession and enables it to progress; and such compensation is not to be compared with money. Men say they have spent so much money on this labor and have not had a just reward. Who wants any reward? I have no sympathy with the whinings of some men that the profession does not recognize their work. This should be a work of pleasure, and as soon as we do it with lofty motives compensation comes to all of us in proportion as we have performed that work well.

Dr. HOWARD E. ROBERTS, Philadelphia. Mr. President, to attempt to discuss a paper of this character without having more than twenty-four hours' notice, is a big proposition if we are going to do the subject justice. And if we entertain the suggested changes, there will ensue a great deal of discussion and squabbling in our local societies before we get down to solid business. There are two main points in the paper to be considered: one as Dr. Truman sees it, and the other as to whether an increase in membership in our state societies and our national society is desired. If a large membership be desirable, then an arrangement something like that which Dr. Bethel says Illinois has adopted would probably increase our membership more than any other way. But to do that, it seems to me, would require an entire reorganization of the different state societies.

Now, when an attempt is made to reorganize a society it is usually the outcome of one of two things; either the society has dwindled down until there is nothing left, and it therefore becomes necessary to reorganize it in order to save it from complete wreck; or else it is because there are two or three factions in the society, fighting like Kilkenny cats, and hampering its advancement. I feel that Pennsylvania is not at present ready to begin this squabble. To establish county societies in Pennsylvania would be a very difficult matter at present, and it would mean practically the abolition of the existing societies, and those who are directly and unselfishly interested in the local societies I think would object to such a movement. It would also mean that the local societies would have to increase their dues, say one or two dollars a year, to be turned into the treasury of the state society. There are very few local societies that with their present dues can do more than pay their own running expenses, and it is a question in my mind as to whether the members would be willing to contribute the extra assessment necessary.

There is also another point to be considered. If a society is to be reorganized a number of committees would have to be appointed; this again would afford a big field for squabbling in conference.

In connection with the records the essayist speaks of, I think it would be interesting if two records could be kept, one of the work done or supposed to have been done by the member himself; and the other of the work which has been undertaken and carried out by someone else. If the men who do research work were to make their own records we would have a very heterogeneous collection. The idea of keeping track of the amount of money spent in original research had never occurred to me, and I think with Dr. Truman, that a man does not go into this work for the sake of glory or remuneration, but he goes into it because he is eager for knowledge, and not for the purpose of having someone else pat him on the back. I think it would be very difficult to keep track of the amount of money expended; if we are going to do that we must likewise take into consideration the expenditure of time, and I should judge that the gentleman who spent forty thousand dollars certainly must have counted the value of his time.

Dr. J. A. LIBBEY, Pittsburg. Mr. President, there is just one point with reference to Dr. Bethel's paper which I would like to emphasize, namely, his description of the organization in Illinois. I advocated in the National association a few years ago that the local societies should report to and pay a certain per capita to the state societies, and that these in turn should be connected in the same way with the National Dental Association. I wish this could be brought about; I wish they could be reorganized so that every local society would feel that it was closely related to its state society, and that the state society was giving its support to the National. The societies are the educators of the dentist. And while I agree with Dr. Truman that a few can probably accomplish more actual work than a big crowd, I also feel that a majority will be benefited by the work of the few, and will be stimulated to do better work, will take more interest in their profession, and will be more willing to help the active workers, if not financially, at least by the encouragement of their expressed appreciation. Consequently I hope the time will soon come when we may have a greater organization among us, something after the manner of the secret fraternities, all supporting a head national body. And one reason particularly for my wanting to see such a condition is that the National association would thereby become self-supporting, would be able to undertake and encourage research work, and to print and publish its own Transactions. Today we have to depend on outside journals for that work, and it should be done by ourselves. I believe if this is properly worked up, in time it can be accomplished, and I believe it will be a step in advance for our profession.

Dr. Wm. Jarvie, Brooklyn, N. Y. I have listened to the paper with a great deal of interest, and particularly the part relating to the organization of the profession in the states of Ohio and Illinois, and with some wonderment, too, at the large membership. In New York state our profession is organized on quite a different basis. It is thoroughly organized, inasmuch as the state is divided into eight districts, those districts corresponding with the judicial districts of the state. The state society is made up of delegates from these district societies, so we have not the large permanent membership in our state society that you have here, or that they have in Ohio or Illinois. I should say, without having the exact figures in my mind, that we have in our state society not more than three hundred and fifty members.

I think, with Dr. Truman, that it would be most desirable to have the profession organized so that all members of the profession could be members of the local societies but not necessarily members of the state or national societies. However, there is something very inspiring in a large meeting, as is demonstrated in the great meeting you are having here—great in numbers and great in intelligence—and it cannot but benefit every member of the dental profession to attend a meeting of this kind. I understand that you have over one thousand in attendance. The benefits to be derived from this meeting will depend largely upon the attitude of those in attendance toward the suggestions contained in the papers which have been presented. For instance, after listening to the paper this morning on amalgams, how many of those in attendance will go home and discard all low-grade amalgams and stick to the high grades, for it was there demonstrated that the high grades were much superior to the low ones, which, as we were told in the paper, are still used largely in excess of those of the high grades. The low-grade amalgams are a little more easily worked than the high grades, a great many using them for that reason; but after such a paper as we have had this morning, would it not be well for every dentist who is using the low-grade amalgam to learn to manipulate the high grades and employ them exclusively, thus rendering services of more value to his patients?

In the paper under discussion a great deal of attention is given to the matter of original research, and large sums are mentioned as having been spent in such work. I presume the sums stated refer to the value of the time occupied and not to money actually spent. Possibly the individuals referred to might have earned such sums practicing their profession during the time occupied at dental meetings. But look at this matter in another light. Suppose these dentists had not spent the time attending the meetings which they did, would they have gained the knowledge which enabled them to have earned the forty thousand dollars mentioned? I tell you, gentlemen, the progress of the dental profession has been through its societies, and when you are away from your practices occasionally for a few days, and spend a few dollars, I assure you that it is the best investment you can possibly make. You cannot afford not to attend the meetings of dental societies.

Dr. BETHEL (closing the discussion). There are no objections to what might be termed an "exclusive society," but it does not seem right that a state society should be made an exclusive one. The object of a state society should be to best further the interests of dentistry in that state, and it would seem that this can be more thoroughly done by interesting as many of the reputable practitioners as possible. When a man becomes a member of an ethical dental society he feels a moral obligation to be professional; it is a stimulus to him to attend its meetings, and this makes a better dentist of him. It stimulates him in his work and increases his interest in dentistry and the profession; and the more dentists of this sort in any state, the better for dentistry in that state.

A few years ago the Ohio legislature voted down a much-needed new dental law because it emanated from the Ohio State Dental Society, which had only about two hundred members, while the dentists in the state numbered some three thousand. Two years ago dental legislation in Illinois was defeated on the same plea, but this last year, when the Illinois State Dental Society could show twelve hundred members out of some twenty-five hundred or three thousand dentists in the state, there was no veto by the governor, and the law was passed.

It is said that not more than ten per cent. of the members of the dental profession belong to dental societies. If there is virtue in dental societies they are certainly worthy of large membership.

Regarding praise for research work, there are probably no researchers who expect it, but it does seem that the profession generally should better appreciate what these earnest toilers have done and are doing to benefit dentistry.

The society record spoken of is not intended for individual laudation, but to show what each member has done to assist in the dissemination of dental knowledge and to serve his profession. It can be optional with the society whether they add to the record anything done outside the society meetings that is especially noteworthy or not. In Ohio this is included, and a seven years' trial of the record has proved its value not only from an historical standpoint, so far as the society work is concerned, but it encourages individual work as well.

The meeting then adjourned for the purpose of taking a boat ride on the Delaware given by the society to its guests and members.

THURSDAY—*Morning Session.*

The meeting was called to order Thursday morning, June 29th, at 10 o'clock, by the president, Dr. I. N. Broomell.

The first order of business was the reading of the minutes of the Wednesday afternoon and evening sessions, by the secretary, Dr. Cupit, which were approved as read.

The next order of business was reports from standing committees.

Dr. Cupit, secretary, then read the report of the Council meetings.

The next order of business was the report of the Committee on the President's Address by the chairman, Dr. JESSE C. GREEN, as follows:

REPORT OF THE COMMITTEE ON THE PRESIDENT'S ADDRESS.

Your committee to whom was committed the President's address beg leave to express their hearty approval of its general features.

and to invite your attention to the following suggestions therein contained, as being well worthy of earnest and thoughtful attention.

His suggestion that dental practitioners should follow the example of physicians, in freely consulting with their fellows in difficult or unusual cases, is timely. Such a course, generally and freely followed, would, as he says, tend to bring about a more fraternal feeling, make available a more extended experience, and inspire that confidence on the part of the patient so necessary to successful treatment.

In line with this are his remarks on the importance of oral hygiene, and we heartily commend his suggestion that this should be given more attention, not only as a phase of operative procedure, but also as an important matter which it is our duty to urge constantly and with emphasis upon the public, even if to do so the strict bounds of ethics must be strained. While such a course may suggest to the public that the profession is seeking a new field of labor, and while indeed such may truly be the case, it opens up such possibilities of increased usefulness to the profession, and of increased healthfulness to the community, as to fully warrant the dental profession in casting aside a seemingly forbidding modesty.

His suggestion that the Board of Dental Examiners should annually make a report of their proceedings to this society, we approve. While the official relation between the board and the society does not make this a duty, inasmuch as they are nominated by the society from among its own members, this can properly be asked as a matter of courtesy. The publication of the questions asked at the various examinations in the proceedings of this body as part of his report, properly credited to their authors, would serve a useful purpose,—first, by enabling the society to eliminate from the board those not properly qualified to serve thereon; secondly, by demonstrating the practical value and thoroughness of the examinations, and affording opportunities to make suggestions for their betterment; and thirdly, as a guide to the teaching bodies so that they may direct their work along lines deemed most desirable by the experienced and skilful practitioners composing the board.

His reference to honorary membership is a thoughtful suggestion. While the honor of honorary membership should not be debased by a too free distribution, or be conferred lightly upon those who have not earned the distinction, the president is, without doubt, quite right when he suggests that this honor has been earned, and is deserved, by far more in this commonwealth than those upon whom it has been conferred. Your committee therefore suggest that this matter be referred to the Council, with the request that they formulate a plan by which the honorary membership list be increased, and yet kept strictly within the bounds of that section of the by-laws by which it is created.

The suggestion that the Committee on Membership so direct their efforts that a large increase in membership be realized in the near future is well-timed. Your committee suggest that to this end the barriers restricting the numbers now annually admissible from the local societies should be removed, and that any member in good standing of any local society in the state, recognized by the State Society, be admitted without question, or, in lieu of this, that the society select and elect its own members without regard to local society membership.

Closely allied to this is the subject of a reorganization of the profession, to bring about a closer relation between the local societies and the State Society, to which the president has referred at length. It is high time that some decided, well considered, and practical effort be made to bring into sympathy and fellowship of the State Society a very much larger proportion of the three thousand dental practitioners within the commonwealth, than the mere handful now upon its membership list. For want of this, the State Society is seriously hampered in its work, lacking alike influence and means to properly fulfil its mission. This will become more embarrassing as time goes on, and the matter should receive promptly your earnest and thoughtful attention.

Your committee heartily approves the president's suggestion regarding the publication of your proceedings. If possible, it should be done by the society itself. They also suggest that a wider distribution of the proceedings would tend to bring the society more prominently before the profession in the state. His suggestion that the Board of Censors should have oversight of the papers, or of the proceedings, does not meet with your committee's approval. It is quite foreign to their work. All that concerns the publication of the proceedings properly belongs to the Publication Committee, and with them should rest the authority to admit, to permit reasonable changes in, or to reject, any and all matters published by authority of the society as its proceedings.

His remarks regarding dental legislation will merit your careful attention. In addition to the suggestions your president has so well made, your committee would further suggest that any new effort should be carefully made with due regard to past experience, and that any suggested law should have for its first object the protection of the public; that it should be concise, plain and understandable, carefully and grammatically worded; and while well covering the ground should not be made to embrace petty details or doubtful contentions, nor yet call for penalties so exacting as to excite sympathy for those falling under its ban.

Respectfully submitted.
Jesse C. Green,
William H. Trueman.
Hiram DePuy.

The Committee on Oral Hygiene, through its chairman, Dr. H. N. YOUNG, then presented its report.

The report was on motion accepted.

ELECTION OF OFFICERS.

The society then proceeded to the election of officers for the ensuing year, which resulted as follows:

President—Dr. H. W. Arthur, Pittsburg.

First Vice-president—Dr. J. T. Lippincott, Philadelphia.

Second Vice-president—Dr. W. A. Spencer, Carbondale.

Recording Secretary—Dr. L. M. Weaver, Philadelphia.

Corresponding Secretary—V. S. Jones, Bethlehem.

Treasurer—R. H. D. Swing, Philadelphia.

Board of Censors—W. H. DeLong, Reading; A. N. Gaylord, Philadelphia; C. C. Walker, Williamsport; H. E. Friesell, Pittsburg; C. C. Taggert, Pittsburg.

Executive Council (for three years)—H. B. McFadden, Philadelphia; H. N. Young, Wilkesbarre; J. A. Libbey, Pittsburg.

Nominations for Examining Board—W. H. Fundenberg, Pittsburg; C. B. Bratt, Allegheny; G. W. Klump, Williamsport; L. Foster Jack, Philadelphia.

Dr. Friesell, chairman of the Auditing Committee, reported that they had found the Treasurer's books correct.

Motion was made and carried that the report be accepted.

Motion was then made and carried to adjourn until 5 o'clock.

THURSDAY—*Afternoon Session.*

The meeting was called to order at 5 o'clock Thursday afternoon June 29th, by the president, Dr. I. N. Broomell.

The first order of business was the reading of the minutes of the previous session, by the secretary, Dr. Cupit, which were approved as read.

Dr. Klump then made the following motion: "That the Committee on Necrology be notified to take action on the death of Drs. Horner and Long." Motion carried.

The Clinic Committee was called on for a report, and Dr. Gaylord, chairman, asked the privilege of making the report later and having it published in the Transactions.

Dr. Arthur moved that the Committee be allowed to report progress, and that the report be sent to the secretary for publication. The motion was carried.

Dr. G. F. ROOT. I would like to offer as a motion, provided we hold the meeting in Philadelphia next year, that the following men be added to the Entertainment Committee: Chairmen of the Executive Committee, Exhibit Committee, and Clinic Committee, for the purpose of conferring with the Entertainment Committee in order that the entertainments may not conflict with the business of the meetings.

Motion carried.

The PRESIDENT. As there is no further business before the society, I will appoint Drs. Shumaker and Roberts as a committee to escort the incoming president to the chair.

Dr. Arthur was escorted to the chair. and in accepting the presidency for the ensuing year said:

Shakespeare said that some men were born great, some achieve greatness, and others have it thrust upon them. This honor so far as it is personal has been in a measure thrust upon me. I have not sought the position, but have rather shrunk from it. I have been "in the hands of my friends," and upon their support I rely in discharging the duties of the office. It has been years since the western section of the state furnished a presiding officer to the society. I do not take the honor of this election to myself, but rather as being conferred upon the western section of the state. Being in the hands of my friends, I hope with their assistance to fill the position as seeking to honor the society and also the section I represent.

The first vice-president, Dr. Lippincott, and the new recording secretary, Dr. L. M. Weaver, were introduced to the society, after which motion was made and carried that the society adjourn until the next annual meeting.

(Report to be continued.)

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Monthly Meeting, October 1905.

The First District Dental Society of the State of New York held a regular monthly meeting Tuesday evening, October 10, 1905, at the Academy of Medicine, No. 17 West Forty-third street, New York city, the president, Dr. Arthur L. Swift, in the chair.

Incidents of Office Practice.

Dr. **Arthur H. Merritt.** There was recently brought to my office, by her physician, a young woman who for more than a year had been a great sufferer from facial neuralgia. The pain, which at times was intense, was confined to the right side of the face, temple, and ear, the pain in the ear being most constant and severe. She had been under treatment by several physicians, without relief. An examination of the mouth showed all the teeth to be in place and in good condition, except the lower right third molar. Upon inquiry I learned that this tooth had been extracted under the influence of nitrous oxid in December 1903. There had never been any doubt in the patient's mind of the complete removal of the tooth. An examination of the parts revealed no soreness, and the tissues were apparently normal; but upon closer examination with a probe a small opening was discovered, and at the depth of about an inch something of an osseous nature was plainly felt. My diagnosis was that a portion of root had been left in extracting, or that some portion of the alveolus had been fractured and remained as a source of irritation. I advised that an exploratory operation be made.

Subsequently the patient by advice of her physician had a radiograph made, which did not confirm my diagnosis, as there was nothing to indicate the presence of roots. The patient, however, decided to have an exploratory made, and came with her physician to my office for that purpose. I carefully cocainized the surrounding tissues with a one-half of one per cent. solution, which I prepared myself, using a normal salt solution as the vehicle for the cocain.

I then made a crucial incision extending to the body of the mandible, dissected back the soft tissues until the bone was freely exposed, when the anterior root was plainly visible. This I removed with a curette. A further examination revealed the presence of the posterior root firmly in place, and this I removed with forceps. These roots were each one-half an inch in length. The wound was packed with gauze saturated with campho-phénique and orthoform, and the dressing changed at frequent intervals for two weeks, when I dismissed the patient, the wound having entirely healed.

The operation, which occupied about twenty minutes, was without pain to the patient. There were no further neuralgic symptoms.

The paper of the evening, entitled "Is There an Ideal Occlusion of the Teeth in the Human Jaws?" was read by Dr. **Herbert Locke Wheeler** of New York.

[This paper was printed in full at page 24 of the January issue of the Cosmos.]

Discussion.

J. N. Farrar. Before entering upon the subject of the essayist, I wish to say that I shall not speak upon extraction of teeth, as my conservative views upon that subject have been extensively published and are probably fairly well known. I am pleased with the essayist's remarks, for the form of his questions shows evidence of much sound sense. Between the lines I observe much intellectual light. The main question he has propounded is this: Is there an ideal occlusion of the teeth in the human jaws? I reply, Yes—just as there are ideal human faces; but these ideals vary in different nations. Men may likewise differ in their opinions, but that does not prove that there are not some faces which would not be looked upon as beautiful by all persons. Granted that early environment gave man a superior antagonism so far as mastication of food is concerned, is that all of beauty? Again, would it be wise to reverse the product of time and return to earlier conditions? If we could reduce the brain power of man, in order to regain the square-on bite, so that he could get his food by gnawing meat and fish from the bone—can we do so if we would, and would it be better for man if we could? Will the widening of the lower dental arch enlarge or elongate the lower jaw bone? Will dentists be so foolish as to attempt to undertake to reverse the environments that caused the change from the square-on bite to that of the overhung upper incisors or the instanding of the lower front teeth? Should dentists bring about the square-on bite profile? or should they try to beautify to the highest possibility the face as they find it at this geological period, when there is not now the need of an antagonism so powerful as in the glacial period of 500,000 or, it may be, of only 3000 years ago.

The reduction of physical exercise in antagonism may account for the reduction in the size of the jaws and all the dental occlusion conditions as seen in modern times, and this may seem to be evidence of degeneracy. But what about the enormous increase of mental power that has brought about the ease of obtaining a living and the vast improvement in the enjoyment of life made possible by scientific knowledge of the laws governing matter which in one way or another have led to the necessity for dentistry? and shall we assert that facial beauty of today is less than at the time of the square-on bite? Is this increase of power of the brain over matter an evidence of degeneracy?

With a knowledge of the etiology of teeth and the various environments brought about by geological changes in the formation of the earth, and the abundance of time to form it in, it is not difficult to understand the possible modification that may have taken place in the relation of the two jaws. If an ideal occlusion ever existed at what period did it exist? Was it at a time when the square-on bite prevailed, or nearer the present time?—when the overhung upper incisors prevail. Has the utility of modern occlusion any advantage over the square-on bite of 2000 or 3000 years or more ago? I think not, but the question is, Is there an ideal occlusion to be found at the present time?

Much may be said upon the subject of dental antagonism, but a great deal has been said that has been unwisely said. The Greek artists thought it possible to reduce the human outline to an ideal, but their works show that the ideals of the best of them varied as much as our ideals vary at the present time. The truth is, there is no one ideal that great artists have agreed upon or applied to all cases.

This is because the variations of human forms, even of the best classes, are so various that it has been impossible to reduce them to one. It is, however, not easy to classify all beautiful forms. As well might the tailor attempt to make one ideal suit of clothes that would make all persons appear equally beautiful, whether short and thick, tall and slim, or lilliputian. The truth is, to cause every person to appear well, each should be dressed in a style best suited to his or her form. This dental subject is too broad to couch on a single fixed rule. So is it in regard to molding the human face by having teeth regulated. Each case should be studied individually, for there is no one form—no one ideal—that can be applied to all. It is not difficult to make rules, but to make a rule for all persons, to adopt one special antagonism with the idea of accomplishing the highest possible for all cases would be attempting impossibilities. Orthodontia is too broad and deep a subject to be pinched into a simple mechanical rule-of-three.

Dr. R. OTTOLENGUI. I hope that what I have to say will be accepted absolutely impersonally. I want to discuss this paper practically, forgetting that it was written by an individual. It is a very important paper, that is, it would be an important paper if published without any answer to it. I do not know whether the author has meant it so or not, but it is in effect an attack upon certain fundamental principles in modern orthodontia, and the possible importance of this attack lies in the fact that it is founded on seemingly scientific research. In brief, we are here apparently offered a scientific excuse for extraction.

I would like to take up certain things seriatim, and the first in order which is the basis of my statement, that this seems to be an attack upon a certain set of orthodontists, is this: The author says, "Having been taught by the modern prophets of orthodontia that under no circumstances must extraction be resorted to," etc. That, I take it, means the men who have been styled the *new* school. I know them all, and none of them has made the statement that under no circumstances should extraction be resorted to. That has never been claimed by any of the modern so-called orthodontists. They say that by no means should there be extraction in any case which can be restored to normal, but it is an unfortunate fact that there are certain monstrosities (and we use that word as a differentiation between classified irregularities and extreme deformities, which latter sometimes are incurable) which occasionally compel extraction. I say it is unfortunate, because it is always unfortunate when there is a fact which can be used as a basis for wrong practice.

To show you more definitely what I mean, as you are dentists largely here, it is a fact that not all roots of third molars can be explored to their full apices, and that fact has caused millions of abscesses which never should have existed. The dogma then is, "Do not extract a tooth which another orthodontist could save."

I take issue with the title of the paper —"Is there an ideal occlusion?" etc. As Dr. Farrar says, there is; but I take it that is not what the author meant. He really means, is there a normal occlusion? Do we ever see that occlusion which we call normal?

Dr. WHEELER. No, I do not mean that; I mean, is there an ideal one?

Dr. OTTOLENGUI. Then there was no reason for writing the paper. There is an ideal of everything in God's beautiful world. Without an ideal of occlusion we could not conceive a normal occlusion, and without the ideal of normal occlusion in his mind no dentist is fit to put up his sign. Let me quote another passage:

"We constantly see so many variations, etc., that I am anxious to know by what authority cases can be sorted out and classified thus and so, and bought appliances used, etc., and presto! we have the ideal occlusion that the Almighty originally worked out for man."

That is not fair; that is not scientific discussion. I do not know of any real orthodontist who says that certain appliances bought by number can be put in the mouth by an ignoramus and be made to bring the teeth into normal occlusion. Unfortunately for the Angle system, it is composed of ready-made parts put on the market and sold. I have been intimately acquainted with Dr. Angle for a long time, and I believe he says exactly the same as I do, that it is an unfortunate thing that he has to supervise the making of these appliances. That it is an unfortunate thing that the manufacturers demand a patent on them; but had they not been made perfect, they would have been damned and thrown aside long ago; and the only reason they are made perfect is for the convenience of the dentist. Those appliances do not accomplish the work themselves, any more than a violin plays classic music automatically. A little patient said to me yesterday when I was fitting an appliance: "I should think that would push my teeth out instead of in." I said, "It will push them out, or in, or sideways, or any way I want." The appliance is for sale, but you must have the system in your head, or the appliance will have no value.

A word about type. A great deal of criticism has been made about Angle's classification. Since I have been observing, with a knowledge of Angle's classification, I have not found anything that would not fall into one of his classes except monstrosities, and those are generally uniques. If a man comes to you with his canines between the molars, of course you cannot bring them to their proper position. You may doubt this, and as a member of the American Society of Orthodontists I ask this society if it doubts this to give us the opportunity for a test. If the gentlemen who are interested in this question of type and the relation between facial contours and dental irregularities will arrange a meeting at which photographs of profiles can be thrown on a screen, and the casts of those cases—good casts—brought, I will venture to produce a committee from the American Society of Orthodontists that will look at the faces on the screen without seeing the casts and tell you the nature of the irregularities. If they can do that, and if they can correct the faults of those faces and restore the teeth to a semblance of normal occlusion, have they not a right to ask the dentist to please not extract teeth merely because it seems more convenient to do it? Are you going to admit that God made a mistake and put too many teeth in a person's mouth? The essayist hints at that, only he says "nature." It is the old idea that a child may inherit the small jaw of one parent and the large teeth of the other parent. If you had a baby born with one foot longer than the other, would you attribute it to the fact that the mother was shorter than the father? Did you ever see such a thing, unless the child was club-footed? Orthopedists do not cut off the long leg to make it fit the other. Why is it that only in the mouth nature makes these mistakes, and why is it that it is the teeth that are always too large and the jaw too small? They never get mamma's teeth in papa's jaw; it is always the other way around.

I want to say a word about the "new school." We voted in Chicago not to call ourselves that. I like the term "modern orthodontists." Old fellows like Dr. Bogue and I will be dead soon, and then young fellows like Stanley and Young will be the *old* school. You do not sneer at the men who fill teeth with porcelain; you call them up-to-date practitioners. Why not do the same with orthodontia?

There is just one more word, and that is about the American Society of Orthodontists and the way it manages its meetings. There are two aspects: the first is, the authors prove what they say; second, the audience expect them to prove it. They challenge any statement. There is no apostle in the society so tall but the least follower in the society will call him down. At every meeting the lantern is provided; you do not need to ask for it. If you have seen something extraordinary, like these edge-to-edge-biting savages, you should have photographed them. In science we cannot take anybody's word for anything that is unusual. Science must deal only with scientific terms, or it must become unintelligible. I hear tonight of "edge-to-edge bites;" I do not know what that means. Incisors are the only teeth I know of that have "edges." If it means there was no overbite, there is a question whether these savages did not need to have their teeth regulated. This data is taken from skulls in a museum. All collections in museums are primarily obtained by men who have the collecting habit, just as I started to make my collection of insects—as many and as perfect as I could find. The craniologist wants all the skulls to have all their teeth in. You have an assorted few taken from a multitude of dead people. If they have kept all their teeth during life they have worn them down, and we are asked to guess what their original occlusion was by examining some loosely jointed skulls put together with teeth half worn away. What changes have occurred since those adults were children.

that would give you any means of comparing what you find there with the patients that come to us, is a question for discussion.

I may be mistaken, but I imagine the author uses the term "edge-to-edge bite" as synonomous with end-to-end bite. I take it among orthodontists that an end-to-end bite does not so much allude to the fact of there being no overbite as to the fact that in articulating, instead of each tooth antagonizing two teeth it strikes but one other and strikes end to end. Unless we use these terms correctly, and understand them, we get no logical deduction, and I do not really know whether the essayist means that these skulls were biting end to end, as I mean it, with a straight line drawn through the upper and lower teeth striking the center of each, or whether he means merely that he found some teeth which have no overbite.

Dr. R. B. STANLEY. Our essayist has asked the question whether there is an ideal occlusion in the human jaws, or, in other words, whether the occlusion can be supremely excellent or conceived as perfect. Perhaps in a literal sense no human being ever possessed an ideal occlusion; at the same time there exists what can properly be termed a normal occlusion—or one conformed to a type or standard.

Dr. Wheeler states that upon examination of some fifteen hundred skulls of various savage tribes he noticed that invariably the cusps were worn entirely away, while the incisor teeth, equally worn down, met edge to edge. He further noted that the teeth were firmly imbedded and were all, as far as he could judge, in their proper positions. We infer also that the dentures he examined did not differ from the dentures in civilized man in point of the number of teeth they contained or general characteristics of the teeth. From further observations on the teeth of the horse, he has noticed a marked change through the thousands of years of its existence, brought about through environment. These observations have led Dr. Wheeler to question whether the "perfect" occlusion heralded by the modern orthodontists is of such importance as they suppose, and also whether the laws governing the evolution of the teeth of the horse are not applicable to the teeth of man—operating to produce an inharmony between the jaws and the teeth, resulting in a malocclusion. He seems to make use of the terms "evolution" and "degeneration" synonymously, for he suggests that there may be something in the "idea that most cases of malocclusion of the teeth are a form or symptom of physical degeneration," etc., brought about through a gradual change in environment.

The first question—as to the importance of normal occlusion—you no doubt have answered in your own minds in support of this so-called "enthusiastic apostle" of normal occlusion. You could not do otherwise without seriously shaking the very foundation-stones of dentistry. It does not require any further opportunity for investigation than that afforded to the dental practitioner to observe the impaired functions of the teeth due to malocclusion. Neither does it require any study of prehistoric skulls to prove to you that there *is* a normal relation, or occlusion, of the teeth of one arch with those of the opposite. There is no question as to the number of teeth allotted to man. The formula has remained unchanged through thousands of years. With these facts before us, how is it possible to question the value or importance of a normal occlusion designed by nature to afford the greatest use to man and be maintained to meet his demands through the greatest number of years? I venture to say that the teeth in the skulls examined by our essayist would not have proved as useful as they did through the many years of hard usage to which they were evidently subjected if they had not been fashioned and positioned to support each other firmly in the same and opposite arch.

As to the laws governing the evolution of the teeth of the horse, or any of the lower animals, we can admit that they apply as well to the teeth of mankind without affecting in the least the number, form, and size of the teeth in their relation to the *size* of the jaws. Dr. Wheeler is inclined to believe that large teeth can be inherited from one parent which are out of proportion to the physiognomy inherited from the other parent. He would therefore in some instances extract teeth to harmonize conditions. This theory has never borne analysis and never will. It is difficult to understand why inheritance is blamed so eternally for conditions which are so plainly the result of factors operating after birth. If the laws of inheritance operate so disastrously to mankind we might expect the weirdest specimens of freaks to eventually inhabit the earth. Men with legs, or feet, or arms, or ears of unequal size—and heaven knows what the internal organs would be like! It is just as rational to apply this theory of unequal inheritance to one part of the anatomy as the other.

Before closing I wish to answer one other question. Dr. Wheeler asked by what authority the many forms of malocclusion are so nicely "cataloged" and "arbitrarily" placed in two types. He states that he has noted many variations from these two types. I know of no classification which includes but two types of malocclusion. The nearest to it is that given by Dr. Angle, and comprises three classes with a possibility of a fourth. If Dr. Wheeler refers to the Angle classification I will take issue upon the use of the word "arbitrary" in his paper. It is not an arbitrary classification; it is not done capriciously or at pleasure; it is not without adequate determining principle; it *is* founded on the nature of things There does not exist—there never did exist a case of malocclusion that the Angle classification will not include. Perhaps it will be of interest to you to know that Dr. Angle did not conceive first the idea of *making* a classification and then dumping all the forms of malocclusion into its divisions. On the contrary, the possibility of classifying malocclusion came to him in one brief hour, during the exhibition (by a fellow practitioner) of a large number of lantern slides illustrating a lecture on malocclusion. At the close of the lecture Dr. Angle suggested to a number of gentlemen present at the time that an orderly arrangement of the many forms of malocclusion was possible—only to have this statement received with laughter and scorn. So sure of his convictions was he that he returned to his office and painstakingly and without prejudice examined his entire collection of models. After days of ceaseless labor he found to his great satisfaction and delight that his convictions must stand. There before him stood evidence unquestionable of an orderly grouping of all the aberrations from the normal. It was nothing new; it had always existed since malocclusion first afflicted mankind; but it remained for his colossal mind to discover it. Long, long years after his bones have turned to dust this simple discovery will stand as a monument to his professional achievements. Mighty in its truth, it will live to hear the death-knell of all theories and practice which question or ignore the laws of occlusion.

The question our essayist has asked, as to whether the ideal occlusion exists in the human jaws, might be answered in the negative. We may speak of an occlusion as ideal because it *is* so from a material standpoint. The ideal exists in our mind and is the standard toward which we should aim. The farther away we drift from it the farther from perfection will be the result; and though we can never attain perfection in material things, we can and should place our standard so high that it would be splitting hairs to refuse to accept it as ideal.

Dr. J. Lowe Young. I have been very much pleased with the remarks made here tonight on the paper of my friend Dr. Wheeler. I had the privilege of looking over the paper for a short time this afternoon, and I must say that I was very much surprised at its contents. I really feel that there is little left for me to say after what Drs. Ottolengui and Stanley have said, but I take exception to one statement made by Dr. Stanley. I do believe there is an ideal occlusion. I do not mean that thirty-two definitely formed teeth, definitely placed, is to be our ideal; but there is an ideal occlusion for every type if we can but find specimens—and we have types innumerable. Not *two* types. Dr. Angle's classification does not give two types; it gives three classes with two divisions and two subdivisions in the second class and a division and a subdivision in the third class. In my opinion, this classification should be understood by every practitioner, until we have something to take the place of it that is better. Dr. Angle had an idea at one time that we should have a certain facial line and arrange all teeth so as to bring all faces to that line. He has seen his mistake, and taken that back; and does not now claim that this is possible. It is types that must be our guide, and we must arrange teeth according to their respective types. We have the Grecian type and the Roman, and the Greco-Roman, and various mixtures, and we must study them. How do we know that we have teeth in proper occlusion for certain types? By studying balance. The artist so arranges his picture on the canvas that it balances, and that is how we must be governed.

The essayist spoke about the wear of the teeth in edge-to-edge occlusion. This is more apparent than real. It is a fact very easily proved, that when we find lack of overbite in the anterior regions we also find short cusps on the bicuspids and molars.

The essayist refers to the loss of a tooth and brings up the question whether it really makes so much difference, owing to the fact that our food is practically fit to swallow when it is brought on the table. This is a point well taken. But when we consider that lack of mastication has more to do with malocclusion than all other causes combined, it would seem about time to select foods that require thorough mastication. It is safe to say that sixty per cent. of all malocclusion is due to lack of use. Furthermore, whenever a tooth is lost, malocclusion in some form always follows, and as one author asserts that ninety-five per cent. of all teeth affected with pyorrhea alveolaris are in malocclusion, it must be apparent to all how essential it is to preserve these priceless organs.

The question of heredity almost seems like a joke, for if we give this question serious consideration the absurdity of it will soon be apparent to all; but, strange to say, this is the principal cause of malocclusion in the minds of those who have not given the question serious thought and study. If it be true that a child can inherit the large teeth of one parent and the small jaws of the other as frequently as supposed, then I ask you why do we not find the same condition in the deciduous teeth? The fact is, heredity has very little to do with malocclusion at all. Nature's plan is to harmonize with the teeth and jaws as well as with every other part of the organism. We do not see a child with one eye brown and the other blue, or the hair on one side of the head red and on the other side black, where the parents have different colored eyes or hair. As soon would I believe a child would be born with a long tibia like the father and a short fibula like the mother, as that he would inherit teeth too large for the jaws. What does take place in my judgment is this: The offspring has teeth unlike either parent, but a blending of both, and if there was no interruption of development in the life of the organism up to maturity, there would be no malocclusion. But owing to the fact that the crowns of the teeth assume their full size so long before the normal time for their eruption, and so many causes come in to retard development of the surrounding tissues, there is very frequently—in fact almost always—some malocclusion.

Dr. E. A. Bogue. I am very much obliged to you, Mr. President, for allowing me to be the last in order of those chosen to discuss the paper, because all these gentlemen have given me ammunition.

I want to say a word or two in regard to the discussion, before devoting myself to the paper.

Dr. Young asks: "How do you arrange for different types?" His friend Hawley answers that mathematically. Dr. Bonwill many years ago brought out a certain articulation. Dr. Hawley of Ohio, who was Dr. Young's intimate friend, has improved on Dr. Bonwill's methods and measurements, and the proof of it was found one night last winter, when three or four gentlemen helped me walk home, and asked if I had in my cabinet the three models of Dr. Baker's son, of Boston—models taken with five years' interval between them. I said I had. They said, "We will take the model of irregular teeth at twelve years, and according to the Hawley system, based on Bonwill's system, we will make a plan of those teeth as they ought to be." We did that. I then took the model which was made ten years afterward, and compared it with what we had, and it was exact.

Dr. YOUNG. May I make a little explanation here? I have been very much interested in Dr. Hawley's scheme of determining the width of the arch, and while that has worked out beautifully in the white race, it absolutely failed in the lower races. It will not hold in every type. We have types where it will hold; but we have some where it will not. About as perfect occlusion as I ever saw is in the skull of a negro. I have the picture, and I also have models made from plaster impressions taken from that skull. According to Dr. Hawley's measurements, the arches are entirely too wide. Nobody would say they were, on looking at them. The anterior teeth are too narrow in proportion to the width of the bicuspids and molars in this type, as compared with the teeth of the Caucasian.

Dr. BOGUE. Dr. Young has referred to something Dr. Ottolengui brought out, and I have in my cabinet some specimens where the central incisors do not quite touch, yet there are thirty-two teeth in those jaws. It is well enough to ask those questions without undertaking to answer them tonight. Perhaps the answers exist; but perhaps they do not. Each one of us will remember those questions and will ask those questions of himself and will want to answer them.

Dr. Young also said malocclusion is due to lack of use, and there is something after birth which causes malocclusion. One would not like to contradict—it is not polite; but he did not say after whose birth. It is possible that the parentage had something to do with it; it is possible that the health of the parents before the birth of the child had something to do with it.

I wish I had Dr. Ottolengui's powers of saying off-hand what he wants to; but I have not. He says that monstrosities may require extraction. He has given me a new expression in that, because there are monstrosities produced by extraction that possibly may call for still further extraction. You see I am making an admission. He has given us a rule: "Do not extract a tooth which another orthodontist can save." That is a good one, but I am afraid a good many of the orthodontists do not look around to see what the others can do.

Speaking of the Angle appliances, he said they do not regulate teeth. That is so. He said it is the *system.* Not many months ago, I saw a case brought into the Institute, and put into my hands to determine what was to be done next. A really intelligent practitioner of our art said he had sent that to Dr. Angle, and that Angle had put the apparatus on the plaster model; but he did not know what to do with it.

Then Dr. Ottolengui said: "Please do not extract." I also say, do not extract; but do let our brethren learn the facts about the positions and uses of human teeth, and then even Brother Wheeler will not extract any more, for regulating purposes.

Dr. Wheeler mentions having examined fifteen hundred skulls or more. Unless one knows just what he is looking for, fifteen hundred or any other number would not yield any information. Dr. Wheeler says: "One condition seems to prevail—an edge-to-edge bite is a universal condition." If that be true, then all the old anatomists are wrong—the whole kit of them—because they talked of incisor teeth—"scissor" teeth.

Dr. OTTOLENGUI. Curators can put in teeth wrong sometimes, too.

Dr. BOGUE. I know that. You can detect those put-in teeth about as quickly as you can see them; I corrected a number in the National Museum in Washington.

Dr. OTTOLENGUI. That is why I say we like to see the photographs.

Dr. BOGUE. Dr. Stanley must be careful when he says that men always had thirty-two teeth, neither more nor less. Professor Windle claims (COSMOS for June 1887, page 412) that man's original dentition included six incisors in each jaw, and if we are descended from the anthropoid apes, there was also a larger number of molars.

Dr. STANLEY. I do not believe that men had neither more nor less than thirty-two teeth. I mean that man in the earlier stage of his existence possessed a greater number of teeth than is found in his denture today; but in the last three thousand years there has been no change.

Dr. BOGUE. I had the honor of reading a paper in Baltimore some two years ago, and afterward went to Washington and saw there Professor Hedlicke. I asked him a few questions about articulation. He invited me to his room, where he gave me a beautiful little lecture about fifteen minutes long. I had gone to him because the curator of the Military Museum, to whom I had said he did not know anything about the subject, said: "Well, there is one man who does—the greatest anthropologist in the world—Dr. Hedlicke, of the National Museum. Go hunt him up." As I said before, Dr. Hedlicke gave me a little talk and ended up by saying, "Now, sir, you may place the most implicit confidence in what I have been telling you, because I have spent my whole life at it, and I have in this museum five thousand human skulls, every one of which has passed through my hands."

I said, "Will you give me that skull behind you?" I made a little preachment about three or four minutes long, to which he made no answer except to invite me downstairs; there was a passageway perhaps one hundred feet long by three and a half feet broad, with cases on the left hand and drawers on the right as high as a man could reach. He opened one of those drawers which contained skulls. I handed him one, and he said "Yes." I handed him another, and he said, "Yes, I see." I handed him a third and he said, "It looks like it;"—a fourth, and he said, "It really looks as though you had some ground for your contention." That continued for an hour or so. I asked him, "Will you read the paper I just read at Baltimore?" He said "No, I cannot waste my time over any such thing as that. Well, send it along, and I will look at it."

He finally read and annotated it most carefully before its publication. Since then he has visited the Indian Territory and examined fifteen hundred Indian children, to get their weight, and height, and girth, to learn the condition of the development of their teeth and many matters of anatomical and physiological interest which we shall get hold of when tabulated; but among the things he said to me upon which I was to rely implicitly was a statement almost identical with that made by Dr. Wheeler, only he put it this way: That it made no difference whether the teeth were end to end, or edge to edge, or a little farther back or forward—it was all normal. That was the expression of Dr. Hedlicke before we went downstairs.

All our knowledge comes, first, through the use of our five senses—seeing, hearing, smelling, tasting, and touching; everything else comes through a process of reasoning. So, no one can convey a new idea to anyone else if that other person has not the germ of the idea already in his mind. And in the present instance Dr. Wheeler's statement of what he has been taught by the modern prophets of orthodontia is so wide of that teaching that it shows conclusively the difficulty of transferring an idea. Either Dr. Wheeler has not apprehended what was taught or those who taught have not been able to express themselves so as to be comprehended. He says,—"having been taught by the modern prophets of orthodontia that *under no circumstances* should extraction be resorted to, and that there was a perfect and ideal adaptation not only of the teeth in the normal mouth, but also of every cusp and sulcus, and that to fail to secure this condition in each and every case left the patient so crippled in the matter of masticating powers that anyone who was so perverse and unskilful as not to secure this foreordained perfection of articulation was guilty of introducing a direct menace to the health and welfare of the patient."

Certain individuals are born blind; some are color-blind; some are born deaf, so, never having heard, they never learn to speak unless they are carefully and laboriously taught; some have club-feet, and some dislocated hips, and all are born with the germs of the permanent teeth irregularly placed, so far as the dental arches are concerned. True, most of these teeth are *regularly* irregular, and if their environment be normal they will erupt into fairly regular arches, and some of them whose conditions are the more nearly perfect will erupt into arches so accurate in their dimensions and their relations to each other that the cusps of all the teeth are brought into active use and fulfill most efficiently their functions as masticating organs. When such a set of teeth is found, it is also found that all the cusps fit into corresponding sulci or depressions in the teeth of the antagonizing jaw, each cusp fitting its own sulcus, the five cusps of the lower principal molars fitting accurately among the four cusps of the upper principal molars, and so furnishing the means for all the other teeth to hold and support each other not only against all backward or forward movement, but against lateral and torsional movement as well.

In all cases where this degree of mechanical perfection is found, we find also an ample development of the upper maxillary and palate bones; a large nasal meatus, a much straighter nasal septum than is found under other conditions, less curving in the turbinated bones and the adjoining facial and nasal bones, including the vomer, ethmoid, and sphenoid are better developed: the cavities in them are more pronounced, the features are more regular, nobler, and more pleasing; the voice is more resonant, and the whole creature is a better one, less liable to succumb to the attacks of disease and better fitted to survive if it be attacked. Such dental arches as these we call normal.

Now, if certain of these normal arches, furnished with the splendid teeth that, so far as I know, invariably accompany these arches, are once seen and understood by the intelligent dentist, he will wish to place all the patients who seek his aid in as nearly the same condition as possible. If he can by careful examination discover an impending irregularity in the mouth of a very young child and can prevent such irregularity, he will be doing more good to the child both as regards teeth and its general health and well-being than he could ever do by any amount of work done to rectify irregularities or decay which had been allowed to come through neglect.

But, before the surgeon, dental or orthopedic, can bring abnormal conditions into normality, he must know what normality is. I agree with the implication of Dr. Wheeler's title, viz, that there is no "ideal occlusion of the teeth in the human jaws"—but there is certainly a *normal* articulation. I have about fifty specimens in my cabinet. I have also more than 1900 specimens in which extraction of teeth has wrought evil results more or less disastrous, and I know of a few cases (some of them are in my cabinets) where extraction under the *then existing circumstances* seems to have been beneficial.

Good surgery is also opposed to the amputation of legs for dislocation of the hip-joint, and Dr. Lorenz has shown that an operation for replacement performed before the child is five years of age is far more likely to succeed than any operation made later in life. It has also been demonstrated that if the principal molars that erupt at about six years of age can be brought into correct relations with each other as they are being erupted, all the other molars will probably erupt into correct positions; and the bones adjacent to the upper maxillary, being relieved of the cramping which is presupposed by a failure to develop in that region, will resume their growth toward the normal, which is always much larger than can exist with contracted dental arches.

If, then, the crowns of the teeth can be made to take their normal positions as they are being developed, the roots will finish their development in their proper positions, and the alveolus will form around those roots so as to give the correct fulness to the face and a contour adapted to the individual in whose mouth this development is taking place.

Now, in such dental arches as these—viz, the normal ones—the wear that ensues as years go on takes place with great uniformity, so that in old age the cusps still remain to triturate the food, and the wear has progressed at the bottoms of the sulci as well as upon the ends and sides of the cusps, and the masticating and triturating conditions are nearly, if not quite, as good as in earlier life.

The wearing down of the cusps first that Dr. Wheeler speaks of, in the skulls of the Indians that he has examined, until gradually the teeth become "worn smooth and perfectly level," takes place only when there is greater or less mal-articulation; and in a great many of these cases nature makes an effort to supply the deficiency of masticating surface by causing the canines and incisors to be worn off equally with the molars—so giving increased breadth of masticating surface. The peculiar hinge of the mandible, causing the lower jaw to swing forward nearly as much as it swings upward, in the act of closing, would, as the molars wear down, bring the incisors into contact in such a manner as to produce the wear just mentioned.

Dr. Wheeler's allusion to the horse and its evolution is not quite to the point, as the first known horse in America was not much larger than a cat. I have seen a skeleton about sixteen inches high, so he evidently did not live on branches or any other hard food that was very far from the ground.

It may be that most cases of irregularity partake of a degenerative quality, and that our soft food and luxurious ways of living are conducive to these conditions; if so, there is all the more need for an intelligent treatment that may at least alleviate existing conditions and not aggravate them.

I want to give Dr. Ottolengui one more hit; if I am wrong he will correct me. I understood him to speak of antagonizing teeth so arranged that the cusps of certain teeth did not fit in between two other teeth. Am I correct?

Dr. Ottolengui. In bicuspids, yes.

Dr. Bogue. Although that expression of Dr. Ottolengui's seems to be true, do not let it be taken as absolutely true. The cusps of the bicuspids are twisted so that an inner lingual cusp will fit into the sulcus of its neighbor. It does not fit in between the teeth. If it does, there is no mastication.

Dr. Ottolengui. I said it antagonizes with two teeth.

Dr. Bogue. But it does not go down that way [illustrating].

Dr. Ottolengui. What I mean is this: What I understand by end-to-end bite is where a tooth antagonizes with only one other; in a normal occlusion, with a few exceptions, each occludes with two.

Some gentleman near me says there is such a thing as large teeth in small jaws. Dr. Young says this statement cannot be analyzed. I would like to have it analyzed, and make an offer to this society. The American Society of Orthodontists at its annual meeting would be delighted to have proof of that statement. This is the proof we would ask you to give us: I would like to see casts of the teeth of the mother and casts of the teeth of the father, so that we can judge for ourselves what the size of the teeth are which have been inherited. If the boy or girl has inherited the small jaw of one parent and the large teeth of the other, I want to see the jaw of one parent normal in its size, and to see the teeth of the other parent so large that they could not be placed within the arches, which latter would be perfect in shape if all the teeth should be extracted. The teeth that would be crowded out would probably be the four canines, because they erupt last. We should be able to extract those four canines, and then have perfectly shaped jaws with those teeth missing. We would then be ready to discuss the matter.

Dr. Bogue. I took the liberty of bringing with me some very curious casts that I nearly forgot. Many gentlemen here will be pleased with them. Before I show them, I want to make a little answer to Dr. Ottolengui's hints. He evidently lost one clause of what I was at work on, and please do not forget this: The roots of the permanent teeth do not develop until after the crowns are in place—in the places they are going to occupy; and when those crowns *are* in place, no matter where they are, the roots develop and the alveoli form on those roots while development is going on. There is no such thing as Dr. Ottolengui was describing a moment ago. If he were to offer you ten thousand dollars for such a case, you could not furnish it. He knows it does not exist.

Dr. Ottolengui. A child of a parent is such though thirty or forty years old. I did not say a baby. The idea is that the large teeth of one parent and the small jaw of another cannot be affixed.

Dr. Bogue. I know it cannot be. I have here the casts of a case where I extracted some teeth for regulating purposes in November 1884, and there is the cast of the same case taken today. No appliance has been put on those teeth; nature has done what she pleased. Extraction was practiced, thinking to do a service to the patient, and the results are before you. The results need to be criticized with the model in hand. I would like you to measure the relative position of the molars and bicuspids to each other. See how the extraction of the first bicuspid has caused the narrowing of the arch above and below. You cannot be mistaken there. Then, alluding to the teeth end to end, I made that patient shut them end to end, and here is the cast taken. The impossibility of an end-to-end occlusion without an unequal wear is plainly to be seen.

Here are two more casts from which bicuspids were taken, also in the same way. Here is a cast taken in 1888, but it shows also what nature does in the way of an effort to correct the trouble.

The President. I understand that Dr. Dalvin, a gentleman attached to the American Museum of Natural History is here, and we would be pleased to have him talk to us.

Dr. Dalvin. Since some aspersions have been cast in a more or less humorous way on museum collections in general, and incidentally on museum curators, I feel called upon to say just a few words about the material upon which Dr. Wheeler has done his work. Most of it has been collected by regular museum expeditions, and by scientific men —not by skull-collectors. On expeditions of that kind everything of scientific interest is collected, and very often the collecting takes such a form that complaints are made because of the large and indiscriminate way in which the collecting is done—not only the good skulls, as one gentleman said.

In regard to the remark that a tooth was stuck in an incorrect position: It is possible that such a thing might happen, but it is very unlikely; and it is also very unlikely that Dr. Wheeler would be deceived by such a misplacement of a tooth. Finally, in behalf of the American Museum, and in behalf of our collection, I would invite any of the gentlemen present who feel so inclined to visit the museum and make use of the collection. There are large collections of skulls, not only human, but those of other mammals, and they would be put at the disposal of anyone who made application. I should be pleased if Dr. Ottolengui would come up there and examine the collection. I think he would go away with a much greater respect for the museum collection of skulls.

Dr. M. L. Rhein. I would like to explain to Dr. Dalvin that Dr. Ottolengui in his remarks did not mean to convey any lack of regard for the collections of skulls that exist; it was only a question as to the value of a report by any individual without presenting it in such shape that it would contain the proper legal dental evidence. Scientists have never taken the word of anyone for a fact, unless accompanied by proof. We can all go up to the museum and see these different things. I have had occasion over and over to call the attention of people with me in visiting museums to the evident desire on the part of whoever had charge of the work to make those skulls present as good an appearance in the cases as possible—not only by placing teeth in the wrong places, but sometimes by placing a tooth in some poor fellow's skull that was no kin to that particular skull.

Without underestimating the value that skull collections possess, I state this as a fact. I told Dr. Ottolengui I had found the mandible of one individual attached to the maxilla of another person. This is a real criticism as regards some of the things existing in museums. It may not exist in our museum here. I have a distinct recollection of seeing more than one such skull at the Peabody Museum, and of seeing a number in the British Museum, and it is simply an evidence on the part of whoever brought such a collection together, of trying to assort a lot of parts and make them present a creditable showing, and they frequently produce things of this kind that keen observation will not fail to detect.

I simply want to reply to the gentleman in order to assure him that there is no slight meant on the value of his collection. We do value them very highly; but it is wise in looking over them to discriminate as to what is genuine and what manufactured for show.

Dr. Wheeler. I have been very much gratified at the discussion this paper has brought out. I think I said it was not my purpose to take issue with these gentlemen. I am surprised that one gentleman who has such a vivid imagination that he ran off into poetry and fiction about the way I acquired this information, could not understand what I meant when I said teeth struck edge to edge.

As to the museum collection, I did not attempt to quote the fifteen hundred skulls, or even one hundred. They do sometimes happen to have the wrong mandible attached to a skull, even in this museum; but I may be pardoned if I say I consider myself competent to judge whether it is the right mandible or not, and those I have reported did have the right mandible attached.

Adjourned.

B. C. Nash, *Secretary.*

MASSACHUSETTS DENTAL SOCIETY.

Forty-first Annual Meeting.

(Continued from page 65.)

The next order of business was the reading of a paper by Dr. Henry C. Spencer, Newton, Mass., on "The Cause and Prevention of Recurrent Decay."

[This paper was printed at page 1330 of the November 1905 issue of Cosmos.]

On motion the subject was passed without discussion.

Dr. Frederic Freeman, Boston, then showed several slides illustrating the restoration of the functions of mastication subsequent to the removal of portions of the mandible. Dr. Freeman showed a very ingenious method of restoring the joint of the jaw by means of the ball and socket. He exhibited a patient in whose mouth he had made an appliance of this character. The results of his operations were very beautifully shown, and the work was very interesting to the members of the society.

The next order of business was the reading of a paper by Dr. HORACE L. HOWE, Boston, Mass., on "The Influence of Mastication upon the Teeth."

[This paper was printed at page 1317 of the November 1905 issue of COSMOS.]

Discussion.

Dr. H. CARLTON SMITH, Boston. Mr. President and members: I presume we are devoutly thankful for the wisdom of the committee in asking Dr. Howe to speak before rather than after the banquet, as one of his strong points is that we all eat too much, and excess of food produces disease.

We will agree that an excess of the *wrong* kind of food or of food improperly taken will produce disease, and there is no question that the treatment of all forms of chronic disorder (not only of indigestion) is rapidly becoming more and more a matter of diet and less a matter of drugs, and we can hardly overestimate the importance of the fact.

A degree of "Fletcherism" is conceded, I believe, to be a desirable habit for all, and in many cases an absolute necessity. I have heretofore, as opportunity offered, emphasized my belief that the systemic treatment of dental disease, or at least the ability on the part of the practitioner to recognize the occasion for systemic treatment, will constitute an increasingly important part of future dental equipment.

Now granting that what we have heard is mostly true, the question comes, What are we going to do about it? I believe that further work in an experimental way on this and perhaps more particularly on some other subjects touched upon during this meeting would be of great value. Some time since, Dr. Kirk of Philadelphia advanced some theories of tooth-erosion which he demonstrated by micropolariscopic methods suggested by Dr. Michaels in 1900. The Chicago Dental Society promptly investigated the theory through a committee of three of its members, whose report appears in the *Dental Review* for April, and closes in this way: "We only wish that the Chicago Dental Society could place this or some other committee in a position where it could prosecute for five years researches in this line, which would result in some startling facts relative to certain lesions in the oral cavity." Such action on the part of the Chicago Dental Society is deserving of commendation—more than that, of emulation.

There is a tendency on the part of many to assume things, and upon such assumptions they build superstructures which seem to me of little value because lacking the firm foundation of thorough experimental investigation. For an instance, the paper by the Chicago committee says, "We feel safe in saying that the life of a membrane has something to do with the formation of crystals. By this we mean that salts which osmose through a live membrane crystallize differently than when they are dialyzed through a dead membrane." I fail to find any record of or reference to work which will substantiate that statement. In the case of potassium iodid we know the statement may not be true. Conservatism in the matter of criticism and a great deal more of thorough and systematic experimentation by dental societies is, I believe, a real need today.

On motion the subject of Dr. Howe's paper was passed, and Dr. Frederic Freeman was asked to conduct the president-elect, Dr. John J. F. McLaughlin of North Adams, to the chair.

Dr. KINSMAN, the retiring president, in introducing Dr. McLaughlin said: Gentlemen, in retiring from the office of president I want to thank all those who have assisted me in making this meeting a success, and I hope that my successor will have as good a time in his capacity as president as I have had. If he does he will have a pleasant time, for my associates have done good work. Dr. McLaughlin, I congratulate you upon your election to the presidency of this society, and hope that you will have a prosperous year.

Dr. McLaughlin, in accepting the honor conferred upon him, said: Gentlemen, I will not detain you very long with a speech. I merely take this opportunity to thank the members of the society for the confidence they have shown in me by electing me to the highest position in the gift of the society, and I will leave it for you to judge whether I deserve the honor. I hope I will have the co-operation of the officers of the society, and also of the members. No matter whom you place in the chair, the success of the meetings depends on the efforts of the members. No president, secretary, or any officer can make a meeting successful without the co-operation of the members; therefore I ask you all to assist me, and by next year you will have occasion to know whether or not your confidence has been misplaced.

On motion the meeting then adjourned until the next annual meeting.

Clinics.

Dr. C. Wesley Hale, Springfield, demonstrated the use of special gold plugger points for reaching cavity margins of difficult access.

Dr. George T. Baker, Boston, demonstrated the use of "Thymoform," a new permanent root-filling and disinfecting germicidal dressing for infected pulp-canals.

Dr. P. B. Laskey, Marblehead, showed an improved form of the "Cervical Clamp, from the Patient's Standpoint," the mechanism being far removed from the tooth operated upon and entirely outside the mouth, thereby securing great accessibility to both and producing a reliable and easily applied clamp, which does not injure the tissues.

Dr. Coleman Tousey, Boston, demonstrated an "Antiseptic Method of Keeping and Using Dental Medicines." For this purpose he showed a series of large-mouthed bottles, holding about two fluid ounces, in each of which was fitted a ground-glass medicine dropper, expanding as it passes the neck to fill the mouth. This was ground to accurate adaptation to the mouth of the bottle, and terminated outside in a rubber nipple—this portion extending far enough from the bottle to allow easy manipulation with one hand. The object is—First, to prevent pollution of any liquid by coming into contact with soiled instruments—more especially tweezers and broaches. Second, the economical use of medicines, just the required amount being dropped on the cotton pledget or medicine slab.

Dr. P. W. Moriarty, Boston, gave a table clinic demonstrating the making of cleft palate velums.

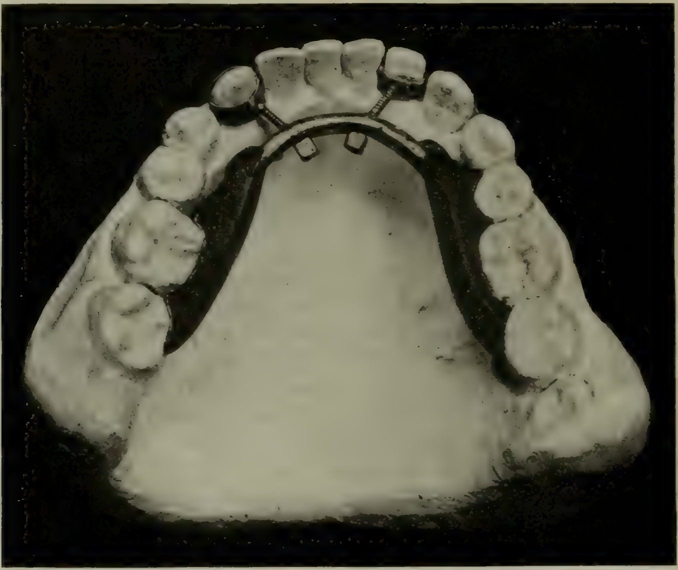
Dr. A. J. Sawyer, Manchester, N. H., "Removable Bridge Work." To make a removable bridge extending from a canine to a second molar, remove the pulp of the canine, fill the root-canal and enlarge it to receive a platinum tube of a size and length to correspond to that of the split pin. Swage or burnish a backing to the lingual and posterior surfaces of the canine. Make a hole in the backing opposite the hole in the tooth, insert the platinum tube, solder it to the backing, replace it on the tooth and burnish it to secure perfect adaptation. Remove and flow solder over the outer surface to give it the proper thickness, cement it on the tooth, and cut the outer end of the tube even with the backing. Another and smaller backing is burnished over this backing and a split pin of iridio-platinum is passed through it and into the tube in the tooth. The parts are then adjusted and the pin is soldered to the outer backing, thus forming the anterior anchorage for the bridge. Now, from a Melotte's metal cast, run into a plaster impression, swage of 22-k. gold plate, gage No. 29 or 30, a saddle extending from one-sixteenth of an inch of the canine to one-sixteenth of an inch of the molar. The molar is crowned and to this crown is attached one part of the Griswold attachment and to the saddle or bridge the other part, thus forming the posterior attachment of the bridge. Plain teeth are then adjusted to the saddle and backed with pure gold, soldered, finished, and returned to the cast. It is better not to set the crown on the molar until the bridge is completed. In this bridge no gold is in sight except that forming the molar crown.

To securely replace a broken facing without removing the bridge from the mouth, cut a slot from pinhole to pinhole in the backing and enlarge or countersink it on the lingual side. Take a suitable long-pin facing, bend the ends of the pins together and unite them with solder to form a staple. Place the facing on the backing, the staple in the slot, and fill the countersink with quick-setting amalgam.

Dr. N. E. Preston, South Hadley. "A Simple Method of Making a Two-piece Gold Crown." Grind the tooth the same as for any cap except that on the masticating surface only sufficient tooth-substance should be ground off to allow for a thickness of No. 20 gage plate. After the band is fitted on the tooth, insert into the protruding end a piece of warm modeling composition and press it in firmly with the fingers. Remove the band and the composition, fill the band with plaster, and after the plaster is thoroughly hard wait several hours before removing the composition by first warming it. Then fit to the end of the band on the plaster tooth a very thin piece of platinum and with a pocket-knife cut little slits all around the edge of the band down to the platinum. Bend the cut edges over the plate, flow enough 18-k. or 20-k. solder over the platinum to build up to the occluding tooth, and finish according to individual preference. This method is for use in close-bite cases and on teeth with living pulps.

Dr. F. S. Andrews, Quincy, "Replantation Case, with a Fractured Root." G. B., age ten years, on December 29th knocked out by a fall the upper right central incisor without fracturing it. The upper left central was also knocked out, fracturing the root diagonally one-fourth of an inch below the gingival line to one-eighth of an inch from the tip. The fractured piece was removed with an elevator. The canals were cleansed and sterilized; that of the right central incisor was filled with gutta-percha and the end stopped with gold foil. A piece of No. 20 gage gold and platinum wire with a small piece of gold plate soldered to one end and with the other end, which was to be inserted into the pulp-chamber, flattened, was cemented in place, holding together the two parts of the broken root. On December 31st the teeth were reimplanted in sterilized sockets and held in position by means of a swaged splint embracing the cutting edges and the palatal surfaces of all the incisors. On January 11th the patient fell on the ice, again knocking out both centrals, but without fracturing them. The upper lip was badly bruised and cut, and the alveolus fractured. In setting the splint the second time the left central was not securely adjusted on account of the presence of blood. This was not noticed until a few days afterward, when an attempt was made to secure the loose tooth without removing the whole appliance. On removal of the splint in March it was found that the right central was firm, but as the splint had worked itself loose again and had been so for some time (as found by questioning the patient) a new splint was constructed consisting of three gold caps, the right central being firm in this instance required no further support. The splint will be left undisturbed for a number of months.

Dr. F. B. Hicks, Brookline. "Orthodontia Appliance." (See figure, p. 186.) This was to expand the arch and at the same time to move inward the lower left canine and the right lateral incisor. It consists of a heavy German silver wire flattened and bent to fit the inside of the lower arch. It is provided with a rubber attachment on each side to fit against the posterior surfaces of the back teeth, leaving the front of the wire free and somewhat away from the lingual surface of the anterior teeth. Two holes were drilled through the wire opposite the lingual surfaces of the teeth to be moved. The lower left canine and the lower right lateral incisor were banded, and threaded wires soldered to the bands were made to extend through the holes in the flattened wire. Nuts were placed on these and tightened. As the teeth moved in,the ends of the wire were kept flush with the nuts to avoid irritating the tongue. The bands were not cemented to the teeth, and the appliance could be easily removed and cleaned and also sprung apart to expand the molars.



Appliance to expand the arch and to move inward the lower left canine and the lower right lateral incisor.

This case was of an adult with exceedingly large and well-consolidated teeth, but the appliance worked admirably.

Dr. C. E. Abbott, Franklin, Mass. "Porcelain Inlays—Brewster Bodies—Turner Furnace." *Cavity preparation.* With ample separation the cavity is prepared and outlined with small square-end fissure and round burs. The cervical seat is made flat and of sufficient depth for retention. The margins are cut to an angle of 90 degrees with the enamel surface and polished with finishing burs, Arkansas stones, or disks.

Matrix formation. Well annealed one one-thousandth platinum foil, rectangular in shape, not too small, is placed between the teeth and is forced to the base of the cavity with a ball of wet cotton. This is removed and with a strip of thin rubber dam the matrix is held in accurate adaptation for a thorough burnishing with Reeves burnishers. In large cavities a second annealing and burnishing with instruments direct is advisable.

Baking. The matrix is carefully removed, and all foreign substances burnt off, when a film of Brewster's matrix lining is glazed over the entire surface of the body to lessen the shadow effect of the cement. The matrix is filled with a yellow foundation body and biscuited. The contour is completed with one or two bakes of body of proper shade. The body is moistened with water, packed as dry as convenient, jarred with serrated carver handle, and any surplus water absorbed with a blotter. The surplus porcelain is carefully brushed off the margins of the matrix before each baking.

Setting. Moisten the piece with alcohol, peel off the matrix, roughen the back of the inlay with thin carborundum stones, cleanse it with alcohol, and dry the inlay and cavity. Set with thin white Harvard cement, regular. Hold in place with a cloth strip. Direct hot air against it for a moment and flow over the inlay paraffin to protect the cement until it has thoroughly set.

Dr. M. C. Tracy, New York. "A New Root-end Preparation for a Porcelain Crown." The root is beveled toward the labial and palatal surfaces, and also at the approximal edges, leaving a narrow floor at the center of the root. The foundation is swaged in No. 30 gage platinum. This forms a seat of great strength upon which to construct the crown. The post is made of iridio-platinum wire and is allowed to extend below the floor for the attachment of the facing. The crown is contoured with any of the high-fusing bodies and finished with low-fusing porcelain.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-seventh Annual Meeting.

(Continued from page 100.)

The President announced as the next order of business the report of the Committee on Scientific Research, by Dr. F. W. Low, Buffalo, as follows:

Report of the Committee on Scientific Research.

Mr. President and gentlemen: In its report last year your Committee on Scientific Research made this, substantially, its concluding and most significant statement: "Unaided, men outside of our profession cannot profitably be relied upon to investigate our dental problems." Along with this statement your committee left to us who follow, as a sort of legacy, a micrometer with Wedelstaedt tubes, some other small machinery, $353, and this question: "Since Dr. Black has shown the manufacturer how to make alloys, how are we to know whether they do, or whether they do not, elect so to make them?"

The alternatives between which, then, we had to choose were—To save our money and ask the manufacturer, or "To tackle the trouble that came our way, with a resolute heart and cheerful." Before you are through with us you may regret the choice that we have made, but your president must bear witness, this greatness was greatly thrust upon us; and having rushed in, we found—alas, too late!—that, "Fools rush in where angels fear to tread"; that rather than be a Scientific Research committee-man, 'twere better to be dead.

So much by way of disarming censorious criticism. As to the question, "How are we to know?" If a natural mineral water should be discovered tomorrow possessed of medicinal value sufficient to warrant marketing, a quantitative analysis certified to by a chemist of state or national reputation would be printed on the label accompanying the bottle. *Why?* Because precedent requires it, and no market could be found for it until such requirement had been complied with. And still it is within the memory of men who are on this floor when no such requirement was exacted. What has brought about this change? Some single exploiter more courageous and more enterprising than his competitors conceived the idea that this was the surest means of profitable and convincing advertisement.

Proprietary or so-called "quack" medicines still abound, and the sick will be forever trying nostrums; but the physician who really cares may easily know today the exact proportions of the ingredients of any true pharmaceutical preparation he is prescribing, and that, too, without the trouble or expense of making for himself a personal analysis. McKesson & Robbins, O. C. Merrill, Parke, Davis & Co., E. R. Squibb & Sons, and many others, no longer are compelled to verify their statements concerning the accuracy of any of their pharmaceutical preparations, because it is known that they keep in their employ chemists who are skilful, and that they invariably make their word good.

From normal fluids to placebo tablets, these firms are in active competition with concerns who are making "just as good," much cheaper, good-for-nothing substitutes; but it is the latter who figure most conspicuously in current bankruptcy proceedings.

For our profession there are many alloys, and—the more alloys, the fewer are our joys.

True it is that no manufacturer is at present making the exact Black formulas, for the very good and quite sufficient reason that Dr. Black emphatically disclaims having himself any exact formula. "Formulæ are not to be depended upon. What is sold as fine silver varies from 97 to 100 per cent. of silver, a variation quite sufficient to destroy the value of the alloy for filling teeth. Therefore, the manufacturer of alloy has to experiment with each batch of material purchased, to find out the proportions necessary to make a perfect alloy, before he can make up his batch of material." The foregoing is quoted from a recent letter written by Dr. Black to the chairman of this committee.

But if there is no exact formula, how are we to know? The proof of the pudding is the eating of it. Two ways suggest themselves. One is for each individual to buy an assay outfit and educate himself to make analyses; to beg or borrow a binocular microscope and a micrometer and then test every ounce of alloy he contemplates purchasing. The other way is, to find that "one single exploiter—more courageous and more enterprising than his competitors" who believes that "the surest means of profitable and convincing advertisement" is to inclose with each package a numbered certificate stating the principal and the modifying metals contained in the alloy and furnishing a micrometer reading of amalgam compounded from it, covering the days of the first month and the succeeding eleven months by monthly statement, thus furnishing a completed record of its actual behavior covering a period of one year.

Signed by a competent amalgam expert this would become a personal guarantee, and his good name would make the expert careful, for if his certificates were found to be untruthful his services to any firm of considerable reputation would not long be valuable. Who would not be better satisfied with such a certificate accompanying a purchase than with a dental convention demonstration made by a special expert—who may be expert only to deceive you—the trouble being that not everyone is an expert.

Why, gentlemen, I believe the word of H. D. Justi & Sons, the S. S. White Dental Mfg. Co., the Buffalo Dental Mfg. Co., the Consolidated Dental Mfg. Co., L. D. Caulk Co., Gideon Sibley, and several others, is quite as good as that of O. C. Merrill, Parke, Davis & Co., or E. R. Squibb & Sons, whenever they give their unqualified assurances. Dr. Black remarks in the letter above referred to, speaking of the experts who have graduated under him, "The gentlemen who have been through this course of study with me are able to take the metals and make what they wish."

"But," you say, "in their advertisements in all the journals each manufacturer claims to be making non-shrinkable alloys."

These all-wool-and-a-yard-wide billposter announcements are one thing, a certificate accompanying your purchase showing the micrometer reading covering a year and belonging individually to the accompanying ounce of alloy is quite another thing. At any rate, the experiment is certainly worth the trying; let us make a concerted effort and see what will come of it.

Your committee last year did not undertake comparative tests of the different alloys, seeming from its report to have some scruples about the propriety of such an undertaking, although upon their own confession they "failed to see how else the great and exhaustive work of Dr. Black is to be directly of benefit to our profession."

Admitting that we are not infallible, yet, burning all bridges before instead of after us, right here is where *we* "rushed in." If we have been guilty of any egregious blunders doubtless the dental manufacturers will quickly set us right.

In making up amalgams, whenever printed directions accompanied the alloys purchased, we tried to follow instructions to the very letter. When none accompanied we amalgamated with slight excess of mercury, keeping account of weights; then mixed in a mortar, finishing in the palm of the hand, and expressing the surplus mercury through chamois skin, wringing the same with only such force as we were able to bring to bear with the unaided fingers.

The charts displayed here show the results of our investigations.*

In concluding this part of my report, I desire to make acknowledgment to Dr. G. V. Black for most valuable information furnished; to Dr. H. D. Hatch, last year's chairman of this committee, for very helpful suggestions; and more particularly to Dr. Emanuel Muntz and Dr. Elberta O. Tousey of Buffalo, who have given me constant and valuable assistance, lacking which it would have been practically impossible to complete this work.

CEMENTS.

Our investigations of cements proved—some sooner, some later—to shrink so considerably that they would rattle out of the glass tube into which they were packed unless the proportion of liquid were so excessive to that of powder that they failed to harden in a reasonable time. Dr. Ames reports that his cements will show better provings if submarined immediately upon completion.

Dr. Black writes: "You will find that the proportion of water in the fluid or added to the fluid has directly to do with the shrinkage and expansion. Also, that the cements that shrink most are the most impervious to color; those that expand most are the opposite."

Recently was introduced a cement of novel chemical construction, containing the following compounds: Calcic oxid (CaO, aluminum oxid (Al_2O_3), magnesium oxid (MgO), silicic oxid (SiO_2), potassium oxid (K_2O), and boric oxid (B_2O_3), combined with pyro-phosphoric, ortho-phosphoric, meta-phosphoric, and aluminum-phosphoric acids. It bears the trade name "Porzellanoid," and is manufactured by Dr. W. Hoffman of Baden-Baden, Germany. It is claimed for this product that it finishes to closely resemble porcelain inlays and that it will wear without perceptible waste for a period of five years. It shrinks badly unless liquefied to a jelly-like consistence for a period of three hours. As to its usefulness, as the Scotch deacon said to the cobbler, "Ah, Sandy, I hae ma doots!"

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*[As this report is almost due for publication it has been discovered that the micrometer with which the tests were made is defective in the part that holds the Wedelstaedt tube. Upon taking the instrument to pieces it was found that a variation of from 2 to 5 ten-thousandths of an inch might occur, blamable to this faulty construction. For this reason the charts referred to are not published with this report. However, upon examination, under a Zeiss binocular microscope, of all the tubes reported, it was found that only four showed good margins; and these four were filled with alloys made by manufacturers whose experts have taken a course of instruction under Dr. Black.—F. W. L.]

THE CONSTITUTION OF THE SALIVA IN RELATION TO CARIES AND EROSION.

We now present the results of a study upon *the bearings which the varying proportions of several chemical constituents found in most salivas may have upon the proneness or immunity to caries and erosion in human teeth.*

A scheme for comparative determination, by reactionary chemical color tests, with the object of determining the presence or absence of sulfocyanates, acetones, glycogen, chlorids, mucoid substances, ammonias, phosphates, and urates has been devised whereby, by the intensity of certain color provings, the relative proportions of these varying substances have been determined.

Examinations have been tabulated on specimens of saliva from the mouths of fifty-five of my patients and those of my Buffalo *confrères*, which seem to your committee quite significant; we may be deemed somewhat *temerarious* to make this announcement, since to attempt an investigation of the human saliva is much like going into a jungle without guide or compass; but the time has already come when this jungle must be explored.

Let us all go in together, then, and in order that we be not lost, let a beating of drums and a blowing of trumpets keep us within hailing distance; thus only will it be possible that we may discover something. The little that thus far we possibly may have discovered seems to be that throughout these investigations, in the mouths of such patients as were demonstrated to entirely lack sulphocyanates in the saliva, were invariably found teeth having an enamel of a dull gray, coarse, unpolished surface, the characteristic appearance noted by Dr. D. D. Smith in teeth particularly requiring prophylactic treatment.

The teeth have many cavities, decay progresses rapidly, the dentin is soft and of a light straw color, it being somewhat difficult to determine whether excavations for filling have been extended to the point where decay is not likely to recur after fillings have been made. The lower incisors decay quite as extensively as the upper, and white spots appear on the enamel where there is no corrosion indicating a change in the coloring pigment.

In connection with these observations we find a bluish gray very thick ropy salivary secretion with abundant white flocculent masses.

A typical chemical salivary test here follows:

		Per cent.
Litmus provings	acids	1½
Sulfocyanates	entirely absent	
Acetones	present	½
Glycogen	"	1
Chlorids	"	3
Mucoid substances	"	1
Ammonia	"	3½
Phosphates	"	5½
Urates—present in the proportion of 3/10,000 grams per cc. of saliva.		

Now, while we have found the sulfocyanates to be invariably absent in such typical cases, we have invariably found them present in a considerable quantity in mouths where teeth are exceptionally good, the occlusion perfect, the patient reporting not having had a single cavity of decay until say after a severe attack of typhoid fever occurring ten years previously. The teeth being well formed, generally retain fillings well. There are occasionally some slight indications of a beginning of erosion, the gum is firm but exhibits a narrow welt of slightly purplish tinge around the necks of all the teeth; no pyorrhea pockets are, however, observable.

Accompanying these conditions will be found a thin watery saliva, possibly slightly tinged with blood, which after standing for two days will become very clear, and with but slight white fine chalky sediment, and the following chemical tests:

		Per cent.
Litmus provings	neutral	
Sulfocyanates	present in abundance.	
Acetones	mere trace	
Glycogen	" '	
Chlorids	present	¼
Mucoid substances	"	2
Ammonia	"	1
Phosphates	"	2
Urates—present in very considerable quantities, namely, in the neighborhood of ½ gr. to the ounce of saliva.		

These are two extreme cases, but the readings throughout the entire series of our experiments have proved invariably that sulfocyanates are completely absent and ammonias and phosphates abundant where teeth are *very* poor, while, on the other hand, sulfocyanates provings have been generous and ammonias and phosphates meager in the saliva about those teeth that were of a most excellent quality.

At a very recent meeting of the Eighth District Dental Society I succeeded in persuading a number of my *confrères* to undertake the scheme which I have followed in my investigations to determine the absence or presence of sulfocyanates. Only two have sent in returns reporting examinations; the rest took away my sample test tubes and straightway forgot all about it.

From my own tabulations I here exhibit two composite pictures or charts. If you will observe on these charts the figures representing the quantity of the various chemical constituents, you can more readily comprehend the relation that the presence or absence of these constituents bear to good and bad teeth.

It must be admitted that a very great number of examinations must be made before it can be said that any of our conclusions are truly conclusive.

A brief series of experiments has been inaugurated to determine if the presence of sulfocyanates in saliva had any restraining influence on bacteric growths.

Nothing was proved, however, except that in one instance saliva naturally impregnated with sulfocyanates, upon incubation in bouillon cultures developed more luxuriantly than the specimens that were free from the sulfocyanates, and that 1 per cent. potassium sulfocyanate solution in the proportion of saliva 1 cc., aqua dist. 1 cc., solution of sulfocyanate 1 minim—seems to have no restraining influence.

Stages in salivary semeiology. Preliminary: Collect 20 cc. of saliva as free as possible from food particles.

(I) Test with litmus paper—both for acidity and alkalinity.

(II) Take 1 cc. of saliva and 1 cc. of distilled water (H_2O) in test tube. Shake, and add a drop or two of ferric chlorid (Fe_2Cl_6). A rich red color indicates the presence of *sulfocyanates.*

(III) Take 1 cc. of saliva and add a crystal of sodium carbonate (Na_2Co_3) and a few drops of Gram's reagent, and warm. The smell of iodoform indicates the presence of *acetones.*

(IV) Take 1 drop of saliva on a clean glass plate. By means of a glass rod, spread out the drop to about the size of a cent. Then with another glass rod touch a drop of Gram's reagent to the edge of the saliva. The formation of a blue color indicates *glycogen.*

(V) Take 1 drop of saliva on a clean glass plate. By means of a glass rod, spread out the drop to about the size of a cent. Then, with another glass rod, touch the saliva with a drop of silver nitrate ($AgNo_3$). Hold over a black surface and the appearance of a white precipitate indicates the presence of *chlorids.*

(VI) To the remainder of the saliva add an equal volume of distilled water. Shake thoroughly; add excess of dilute acetic acid. Shake thoroughly, and filter. The precipitated matter is the *mucoid substances* in the saliva.

(VII) In a small beaker place 50 cc. of distilled water and 5 cc. of the filtrate from experiment No. VI. Add 2 cc. of Nessler's reagent. The appearance of a yellow tint signifies the presence of *ammonia.*

(VIII) Take 5 cc. of the filtrate from experiment No. VI and acidulate with dilute nitric acid (HNO_3). Add a few drops of ammonium molybdate. The appearance of a brilliant yellow precipitate signifies *phosphates.*

(IX) Take 10 cc. of the filtrate from experiment No. VI and acidulate with sulfuric acid (H_2So_4). By means of a burette, run in potassium permanganate ($K_2Mn_2O_8$) until the pink tinge remains in the solution thirty seconds by the watch. The amount of permanganate solution required indicates the amount of *urates* present.

Now, following the precedent established by our predecessors of leaving a legacy to those who are to follow after, we propose to leave as ours this line of investigation. To burden you with the recital of the chemical schemes upon which we have based our work would be tedious. but we will gladly furnish them to any young Columbus who will venture forth on a voyage of discovery on this slippery, slimy sea.

Thanking you for your courtesy in listening with patience,

Respectfully submitted,
Frank W. Low, *Chairman.*

Discussion.

Dr. J. P. Buckley, Chicago. I have enjoyed the paper very much, but I enjoyed much more the reading between the lines rather than what was actually written, because I have reason to know some of the difficulties the committee has encountered in carrying on the work, and I have only words of commendation for anything of this character. The essayist has forestalled any criticism by simply stating that this work was practically just begun. I think there is too much of a tendency in our profession to criticize such work as this. There are two kinds of criticism, however: one where men feel constrained to criticize and censure another man for attempting to undertake anything of a scientific nature. That is bad. The other kind is where men differ honestly with the investigator and show reasons for that difference of opinion. That is the kind of criticism we all want.

There are many things in the report that interested me—the amalgam tests, the cement question, the saliva tests, etc., as I have had some experience in this work. In the laboratory at college we used to make amalgams simply to experiment with them. We also analyzed the saliva and experimented with it, and in the past year Dr. Hinkins, Dr. Cook, and myself have been appointed by the Chicago Dental Society to investigate the subject of erosion, and we also investigated the saliva.

I want to discuss the three parts into which the paper is divided—amalgam, cement, and saliva.

With regard to alloys, Dr. Black says there is no exact formula. It is almost if not quite impossible to have an exact formula because so many influences enter into the manufacture of alloys that change the formulæ. By that I mean that there are a great many things which if the directions are not followed closely will have a tendency to change the alloy. For instance, in fusing a certain amount of two metals unless one is exceedingly careful in the process the proportions are not the same as started with. Some of these base metals are volatile; zinc is one of these. Unless one is careful in adding the zinc, volatilization as well as oxidation of some of the metal will take place, thereby changing the composition of the formula. One may think he has an exact formula, but has not, because he has changed the relation of the constituents of the alloy. Another factor to be taken into consideration is that we do not know whether the union of metals in an alloy is a physical or a chemical phenomenon when the metals are fused. When the metals are fused there is a blending of the mix, but whether it is an atomic blending or not we do not know. I do not believe it is. Yet we have more than a physical union, and that is demonstrated by the fact that one can fuse metals, say sixty per cent. of silver and forty per cent. of tin, and make an alloy that will not expand or contract much. Now take one-half the amount of these same metals without fusing them together and mix them with what has been already fused and you will have an alloy of different physical properties with results showing that there must be some change taking place when they are fused together, even though it be not a chemical one. We know it is not purely a chemical union, because the metals do not lose their identity.

One other point I would call attention to in regard to having an exact formula for an alloy: If your tin be not properly incorporated with the silver, then in the amalgamation of the metals and the squeezing out of the mercury, a change in the formula will be the result, because, not being thoroughly incorporated, and the tin being more readily amalgamated, an excess of it will be squeezed out and this will of course change the original composition of the alloy. The force with which the mercury is squeezed out of the mix will likewise make a difference in the proportion of the metals in the alloy, as shown in the chart.

Dr. Low. It seems that many times in following the same method of mixing the same alloy we get different results.

Dr. BUCKLEY. There is no doubt that we expect to get amalgams too cheaply. I don't believe you can buy silver and put sixty per cent. in an alloy and be able to sell it for one dollar, yet many expect to get a good alloy for that price. There is also the question of aging the alloy. The manufacturers make such large quantities and sell such large quantities that they do not keep it long enough before putting it on the market, and we cannot expect them to do this when we expect to get it at such a low price.

Dr. LOW. Could the alloy makers, with a reasonable amount of care, be expected to give us an alloy that will make an amalgam that will expand a trifle and stay there?

Dr. BUCKLEY. I do not think they can. Because of the peculiarity of the metals and the influences entering into the manufacture of the alloy, they cannot control that.

Dr. LOW. If we cannot expect this, how can we expect to get the proper results?

Dr. BUCKLEY. We can expect them to do better than they do, and there is no doubt that the demand made upon the manufacturers for alloy after Dr. Black's formulæ has given us better amalgams than we used to have.

Dr. LOW. That is proved by the charts.

Dr. BUCKLEY. With regard to the cement question, the essayist did not say any more than that he put the fillings in glass tubes and they rattled out. I would like to know if the tubes were ground?

Dr. LOW. No.

Dr. BUCKLEY. That makes a difference. Were the cements allowed to set submerged in water?

Dr. LOW. No.

Dr. BUCKLEY. That also makes a difference. You will find that if the glass tube be ground the same conditions will not take place. You also have a different condition in the mouth, as those occurring in the test tubes cannot be duplicated in the mouth, as there the cement comes in contact with the saliva. I also believe that water is necessary in the setting of cement, as crystallization cannot take place without a certain amount of water of crystallization, and as these cements must crystallize, they must have water to do so.

Now, the proposition in regard to the saliva is an exceedingly interesting one, and the sooner the profession makes up its mind to know more about it the better off we will be. I smiled when I read Dr. Low's comparison of the investigation of the saliva to the going into a jungle without a guide. That is just the way I feel about this subject. We will have to be careful how we wade into this, as we may get in over our heads.

There is something to the question of the presence or absence of cyanids in the mouth—the absence of cyanids in the saliva where there is little or no caries, and their presence in cases where there is considerable caries. Unfortunately for me I was unable to understand the translation of Dr. Michaels' article, although I studied it very hard, and I was very sorry that I could not understand it, because I think it has a great deal to do with this question. His conclusions seem to indicate that in mouths that are prone to caries there is an evidence of the sulfocyanids, and when present the germs develop more actively. We know that in the absence of sulfocyanids the micro-organisms are less active, and in teeth where there is practically no caries the presence of sulfocyanids will make the germs more active. It is a fact we learn in bacteriology that the different salts have a great deal to do with the activity of germs. Now, if we take saliva and place it in ammonia salts, we find that the germs develop more rapidly than if no ammonia salts had been added. The same thing is true if sodium salts be added, the germs will still grow and be active. In potassium salts, while the germs will not die, their growth seems to be checked, and they are not nearly as active as in the presence of the ammonia and sodium salts. So then when we refer to the presence or absence of sulfocyanids, it does not mean much. When you say that there is calcium present in the teeth, it does not mean anything to me. I want to know *what* salts of calcium are present. You tell me that in the saliva by the ferric chlorid test you discover the presence of sulfocyanids, but you have to go a step farther and find out what sulfocyanids are the ones formed. You will find that the sulfocyanids of ammonia increase the vitality of the germ, and Dr. Miller tells us that caries is due to micro-organisms. Now, perhaps I will have to explain what I am trying to say. With the presence of sulfocyanids, if it be the sulfocyanids of ammonia you have an increase in the activity of the germs and more caries. I mean that you must test for both the positive and negative radicals and ascertain definitely what salts are present.

Dr. Low. We only made tests for the presence of ammonia.

Dr. BUCKLEY. You will have to go farther than that; that does not mean anything. Ammonia does not remain there as such, for there are many things with which it unites. The thought I would express is to take a step farther, and if you find ammonia, find what salts are present—find definitely what salts of sulfocyanic acid are there when sulfocyanids are present.

I could take up and discuss Dr. Kirk's theory of erosion along the same line and bring out some points that I have found in investigating the subject, but I will not do it here as the hour is too late.

The committee has done excellent work and is to be congratulated. It is by working together along these lines that we can ultimately arrive at a correct solution.

The subject was passed.

Dr. JARVIE. To my mind the meeting just drawing to a close has been a remarkable one. Never have I been so proud of being a member of this society as during the past two days. The literary merit, the ability displayed by the essayists, the knowledge and ability to think and to speak on their feet that has been shown in the general discussions of the papers, and the *personnel* of the entire meeting has been such that I have cause to be proud of it. I regret exceedingly, though, that the time has been so short, and that there has been so much to do in the limited time at our disposal. There is nothing left for me to do as presiding officer at the present time but to ask Dr. Hofheinz and Dr. Butler to conduct the president-elect to the chair.

Dr. Turner was conducted to the chair and, in presenting the gavel to him, Dr. Jarvie said: In thanking the society for all the consideration that has been shown me as your presiding officer, I can wish Dr. Turner nothing better than that he may receive that same kindness and same consideration at the hands of the members of the Dental Society of the State of New York and its many friends throughout the country that I have received. And, Dr. Turner, I congratulate you on election to this honorable position, and can say to the members of the society that I know you will bring to the duties of this position the ambition and energy that will bring forth fruit, so that when we come here next year we will have even a larger and better meeting than that which is just being closed.

Dr. TURNER (in accepting the gavel). Members of the Dental Society of the State of New York: I thank you very much for the honor you have bestowed upon me in electing me to this position, and in accepting it, it is with a deep sense of gratitude for the confidence shown, and also with a very full appreciation of the responsibilities assumed by myself. These responsibilities would be overwhelming were it not for the very kind words that have been said to me since my election, and the many assurances of help. I feel very sure that the consideration and good treatment shown to Dr. Jarvie will also fall to my lot.

This is no time for a speech, but I cannot help saying that I have a very high regard for the Dental Society of the State of New York, and I feel that it holds a very exalted position. As the years go by it seems that every meeting is a little better than the one preceding.

This is the result of much hard work; it means that a great deal is going to devolve upon the officers as we go along. But I assure you it will be my endeavor to leave just as hard a task for my successor as Dr. Jarvie has left for me.

Dr. HOFHEINZ. The retiring president has spoken of the excellent meeting, the papers, and the *personnel* of the gentlemen who have discussed the papers. Of course it was not his place to speak of himself, but I do believe that a great amount of the success of the meeting has been due to Dr. Jarvie's personality, and if it had not been for his wonderful personal magnetism and manly qualities as a dentist and a gentleman the meeting probably would not have been so successful as it has been, and I move that we extend a rising vote of thanks to the retiring president, who has shown himself so thorough in every possible way.

Motion was carried unanimously, and the society extended a rising vote of thanks to Dr. Jarvie.

Dr. JARVIE. I thank you, gentlemen, most sincerely.

There being no other business before the society, Dr. Turner declared the meeting adjourned until the next annual session.

CLINICS.

Dr. W. CLAY MIDDAUGH, Easton, Pa. "Jenkins' Prosthetic Porcelain as Applied to Pivot Teeth."

The root of the tooth is prepared by grinding down the labial or buccal surface nearly to the process; the lingual edge is left flush or a trifle above the gum line. A half cap of platinum, No. 29 gage, is then constructed by bending a strip of platinum one-eighth of an inch wide and long enough to embrace the lingual half of the root, in the shape of a horse-shoe. When this half band has been nicely fitted to the root it is removed and placed on a flat piece of platinum large enough to cover the end of the root, and soldered with pure gold. This half cap is then placed on the root and trimmed to fit. While on the root the cap is punctured with a piece of iridio-platinum wire, No. 15 gage, leaving enough wire standing above the cap to be embraced by the pins of the facing, or to be used in another way hereinafter described. Solder the cap and pin with pure gold. You now have a fixture completely covering the end of the root with platinum, and encircling only the lingual half of the root. This does away with the band so often seen at the neck, and at the same time in conjunction with the pin in the root-canal offers a very strong resistance to any force exerted in the act of mastication. The half cap is then placed on the root, and a facing ground to fit, or an impression and bite taken in the usual way and the work done from the model. If the crown to be made is for any of the six anterior teeth, a suitable facing is ground and the pins are bent so as to touch the iridio-platinum post and soldered with pure gold. Jenkins' prosthetic body of the proper shade is then mixed with alcohol to the consistence of thin paste and applied. In the case of a bicuspid crown a saddle-back tooth can be used to advantage. One of the nicest bicuspid crowns can be constructed by using a Consolidated pinless tooth. Notches are filed in that portion of the post standing above the cap, the tooth is ground to a proper articulation, and Jenkins' body is flowed through the slot in the tooth and around the pin, after which the tooth is baked.

A very good temporary crown can be constructed in a few minutes by taking a suitable facing or rubber tooth, bending the pins around a platinum post inserted in the root-canal and building Jenkins' body around the pins to the proper contour. This crown is set with Evans' gutta-percha cement. A crown made after this fashion will remain in position for weeks.

Dr. Middaugh demonstrated that the Jenkins prosthetic body holds its color well, and that it is easily carved and manipulated. A pyrometer is not necessary in work of this kind on account of the low fusing-point of the porcelain, and the work can be watched while in the oven.

Dr. M. C. Tracy, New York. "A New Root-Preparation for a Porcelain Crown."

The root is beveled from the center labially and palatally, and also at the approximal edges, leaving a narrow horizontal floor at the center of the root. The floor or seat is swaged in No. 30 gage platinum. The post is made of iridio-platinum, and extended below the floor for the attachment of the facing. The crown is contoured with Close's high-fusing body and finished with Brewster's body. The advantage of this root-preparation lies in the seat formed by the many angles.

Dr. F. Messerschmitt, Rochester. "Appliances for the Correction of Irregularities."

The clinician gave a demonstration of the carving of the model, making of partial clasps, bending the wires, and doing the soldering for making appliances as described by Dr. Jackson in his system of correcting irregularities of the teeth. In the making of these appliances German silver wire was used. The partial clasps were made of gold, gold-faced platinum (the gold surface to come into contact with the teeth) or German silver coated with chemically pure tin by means of the soldering iron. The appliances were soldered with chemically pure tin (Merck & Co.) with the soldering iron, using a weak solution of zinc chlorid as a flux. The advantage of pure tin over soft solder the clinician claimed is that it is cleaner in the mouth, does not disintegrate, and appliances soldered with it can be worn for a considerable length of time without any danger or fear of the wires becoming loose.

Dr. W. H. Leak, Watertown. "Amobilis Root-Canal Cement."

Dr. Leak demonstrated the use of Amobilis as a root-canal filling in a number of extracted teeth. This preparation was shown to set very hard in a short time in the root-canal, but on the application of water could be easily removed from the canal. The clinician also demonstrated in a number of tests the advantages of Amobilis over chloropercha, zinc oxyphosphate, and one of the leading mummifying pastes. The clinician claimed that this material is more easily inserted into the root than other materials, sets very quickly with practically no shrinkage, and is easily removed should the conditions demand it.

Dr. R. H. Hofheinz, Rochester. "Gold Inlays."

Dr. Hofheinz demonstrated the making of inlays by the use of 22-k., No. 28 gage, gold. The gold is burnished upon the long bevel of the cavity margin and set in gutta-percha, after small pins have been soldered to the gold. The clinician said that these inlays would endure little or no stress, and were principally applicable for large buccal cavities.

Dr. J. H. Beebee, Rochester. "Darby's Tin."

This clinic consisted in the demonstration of the making of tin into a filling material by turning thin shavings from a block of pure tin, distributing them on a sheet of paper, placing another sheet over them and rolling them into a sheet of tin with a round substance like a pencil. This sheet is then cut into desired sizes and used as cohesive gold is. In order to make a successful filling the sheets must be freshly made.

Dr. V. H. Jackson, New York. "Irregularities of the Teeth."

The clinician demonstrated his method of preparing the model and also constructing the appliances. The different parts of the appliance, partial clasp, spring clasp, base wire and springs were prepared and held in place on the model for soldering. Models of the face and teeth and appliances for the correction of numerous cases were presented.

Dr. F. Ewing Roach, Chicago, Ill. "A New Fusible Cement."

Dr. Roach showed a new fusible cement, the prominent features of which he claimed were simplicity of manipulation and great strength. This material was used in the making of inlays without the necessity of a matrix. The material is mixed to a putty-like consistence, molded into the cavity, removed and baked. A second mix is then made and added to the cervical surface of the original bake and again molded into the cavity, compensating for the shrinkage and perfecting the fit. He claimed that two bakes were sufficient for the most complicated inlays. The material is also used to great advantage in securing perfect adaptation of the ready-made porcelain crowns. In view of its great strength and ease of manipulation, this material may be used advantageously for inlays, crowns, bridges, and partial plates in all inconspicuous localities.

Dr. A. J. McDONAGH, Toronto, Canada. "Treatment of Pyorrhea."

Dr. McDonagh demonstrated his method of the treatment of pyorrhea. He laid great stress on instrumentation in the removal of the deposits from around the teeth. Nervocidin (about 1:1000) was used as an anesthetic during the removal of the deposits. Hydrochloric acid (75:100) was used to break up the attachment between the deposits and the roots of the teeth, and trichloracetic acid (saturated solution) was used to destroy tissue that was not performing its proper function.

The clinician advocates massage by the operator and patient, and instructs him as to the correct way of carrying out this phase of the treatment. He also instructs the patient in the use of the tooth-brush. The clinician claimed that he can cure pyorrhea by this method in at least three treatments, but that usually he succeeds in one treatment.

Dr. M. I. SCHAMBERG, Philadelphia, Pa. "Surgical Treatment of Alveolar Abscess."

Dr. Schamberg showed drawings, X-ray pictures, and sections of jaw-bones illustrating his method of surgically removing the necrotic bone and the apices of teeth, for the cure of chronic alveolar abscess. His method consists in the rapid eradication of the diseased area under nitrous oxid, using a lip and cheek retractor and surgical burs of his own design. The burs are large, having but three blades, and when made to revolve rapidly in a dental engine pierce the gum and alveolus and cut off the apical end of the tooth within a minute's time. The excavation in the bone is syringed and packed with iodoform gauze until it fills from below with granulation tissue. The clinician makes it an invariable rule to precede and supplement his operations with the taking of radiographs, so as to insure accuracy in operating.

Dr. H. S. MILLER, Rochester. "A Method for Investing and Packing a Rubber Denture."

The impression and cast is obtained in the usual way. The teeth are then set up on the wax plate and properly articulated. A wax trial plate is made approximating the form desired for the completed denture. The wax plate is then placed on the model and invested in the lower part of the flask as low as the model will permit. The teeth are covered over their cutting or grinding surfaces with plaster as thick as the flask will permit. The investment is then beveled in order to facilitate the removal of the upper portion of the flask. The investment is then varnished and the upper portion of the flask placed in position and filled with plaster. The flask is next warmed and separated and the wax removed. No gates are cut in the cast except one at the rear. The clinician claims that in this way the teeth are held firmly and the articulation is kept perfect no matter how the flask is closed. No rubber is wasted, as the operator sees just how much rubber is required, and in using pink rubber it is readily placed where needed and there need be no fear of its being penetrated by rubber of a different color. This method requires a flask broad anteriorly and extra deep to allow for a sufficient backing of plaster.

Dr. E. B. Lodge, Cleveland, Ohio. "The Lodge Band Matrix."

In his clinic Dr. Lodge demonstrated the use of the Lodge band matrix, and also a pair of matrix pluggers. The matrix is distinctive in that it consists of a band of No. 36 gage German silver, well polished and nickel plated, which encircles the tooth, forming a loop by passing through itself, and is tightened and retained by means of a screw which lies along the buccal side of the tooth. This screw is tightened and loosened by turning it with the thumb and finger when operating on the bicuspids, but when a molar is to be filled a small wrench is used to facilitate its application. The bands are still further distinctive by being cut on a curve such as will accurately fit the constricted neck of the tooth. The matrix is suitable for fillings of gold, tin, or any of the plastics. The interproximal space is not encroached upon and the knuckling against the adjacent tooth is assured. The bands are easily applied and well-nigh universal in their adaptability.

Dr. Lodge believes the operation of polishing the filling is greatly reduced by the use of this instrument and that a better result is obtainable than is likely without it.

Dr. F. L. Fossume, New York. "A Universal System of Bridge Work."

The desirability of having a universal system of removable bridge work has always been recognized, and the clinician claims to have satisfactorily solved the problem. The method is based on the fundamental principles on which any bridge should be constructed—namely, that the pillars or abutments act as a support to each other, as by their combined strength the abutments are able to withstand stress which would otherwise loosen them or move them out of their relative position to one another, especially when the bridge is not worn, as during an illness. Models of several cases were shown, two being duplicates of dentures then in use, in which the absorbed gum tissue was restored in order to give full contour and form to the lips and mouth in such a manner that the patient was enabled to keep the mouth and denture perfectly clean. The key to the whole construction and the feature of novelty in this bridge is the bar which connects the attachments of the piers, holding them firmly in place and preventing any spreading apart or contraction, and giving a solid foundation to the removable piece. For instance, where a lower bridge is required between the third molar and the canine, a gold crown may be used as an attachment on the third molar, and any other appropriate form of attachment can be used on the canine. After these attachments are constructed and placed on the abutments an impression in plaster is taken as for a stationary bridge. On this plaster impression is fitted an iridio-platinum bar, running from one abutment to the other, fitting neatly on the ridge. This bar is then tacked in place with hard wax, the whole invested and the bar soldered to the abutment pieces. It is then placed in the mouth and a new impression is taken and model made on which is swaged a platinum piece fitting perfectly over the bar and alveolar ridge. On this platinum base suitable attachments, preventing the removable piece from sliding out of place, are constructed, and the teeth are attached either with rubber, gold, or porcelain. This method, the clinician claimed, was applicable to every case where removable bridge work was indicated, and had proved a great success.

Dr. H. H. Tompkins, Utica. "A Detachable Tooth Bridge."

This clinic consisted of a demonstration of a bridge made up entirely of Brewster's replaceable bridge teeth and possessing all the advantages of an all-porcelain bridge, at the same time avoiding the serious difficulties encountered in the construction of the all-porcelain bridge. A bridge of this character can be made from any of the detachable teeth now on the market, but this special form of dummy teeth is such that it gives them great strength, and they also have the merit of being perfectly practicable in cases of very short bites. The clinician claimed that in assembling a bridge of this kind the disagreeable feature of taking an articulation in plaster and the difficulties encountered in putting the broken pieces together were entirely obviated. This end is attained by first making the caps or crowns for the abutment teeth in the usual manner, placing them in the mouth and taking an impression in modeling compound, this model being sufficiently accurate for all practical purposes in articulating the dummies. In the case of a four-tooth bridge, the anterior dummy is waxed to the anterior abutment crown and the posterior dummy is waxed to the posterior abutment. The porcelains being removable, it is but a few minutes' work to solder the dummies to the abutment crowns. The joint between the dummies not yet having been soldered, the bridge will be in two sections. These two sections are placed in their respective positions on the abutment teeth, and investment material placed in a small impression tray, and the sections are removed in the investment material. Thus the bridge is actually invested while in position, and after the subsequent soldering the bridge will always return to the proper place.

Dr. G. W. COCHRAN, Erie, Pa. "The Old and the New Way of Constructing Porcelain Shell Crowns."

The old way. This was simply a modification and improvement in the original "Land Jacket Crown," the only difference being in the palatal or lingual aspect. Dr. Cochran's method of constructing the jacket crown was by the use of very thin platinum on the palatal or lingual portion of the matrix. By a system of burnishing the platinum to the matrix, already adjusted to the tooth, a well-defined undercut is secured in the matrix that affords an additional thickness as well as a much firmer attachment of porcelain at what is recognized to be the weakest point, namely, the palato- or linguo-incisal edge. Otherwise the construction of the crown does not differ materially from Dr. Land's method, with which the profession is already quite familiar.

The new way, or the all-porcelain shell crown, reproducing the entire enamel surface. With this style of crown, the tooth is prepared as for the jacket crown, a 1/1000 platinum foil is used in making the matrix. An ordinary plain vulcanite tooth is ground for the facing or veneer. After the porcelain is fused the platinum foil is detached and a much better appearing crown is procured than is possible by the old method. For a detailed description of the method of making the all-porcelain shell crown reproducing the entire enamel surface, the reader is referred to articles in the DENTAL COSMOS for June and August 1903, by Dr. C. H. Land, Detroit, Mich., and also in *Items of Interest,* by Dr. E. B. Spalding, Detroit, Mich.

Dr. SINCLAIR TOUSEY, New York. "X Ray in Dentistry."

The clinician showed a number of radiographs of impacted third molars and also a number showing the exact position of unerupted teeth. In one of these cases the lateral incisor had begun to be abducted and rotated, the cause being clearly revealed by the X-ray picture. The unerupted upper canine was seen to be erupting directly against the root of the lateral incisor near its apex. Other X-ray pictures were exhibited showing the cause of some cases, as abscess and absorption about the apex, and in some cases necrosis of the jaw. The pulp-cavity and root-canals were clearly seen, also the condition of root-fillings and the presence of pulp-stones.

Dr. Tousey's demonstration consisted of: (1) The X ray, as used in making pictures of radiographs of the teeth. (2) His special X-ray tube for the treatment of pyorrhea. This tube is made entirely of lead glass, opaque to the X ray except at the part where it is to be applied directly to the gums. (3) The application of high-frequency currents by means of ultra-violet ray vacuum tubes. This he reported as having been successful in combination with the X ray in cases of pyorrhea alveolaris. (4) A film carrier and indicator for dental radiography. The film measures about three by four inches, is placed horizontally in the mouth and held there by the patient closing the mouth upon it. The indicator points to the spot, either below or above the level of the film, where the X-ray tube should be placed. It is adjusted so that any particular region may be most clearly shown, but practically the whole dental arch is pictured on a single film. The film carrier and indicator is a device of his own, demonstrated here for the first time. The idea of horizontal projection in dental radiography originated probably with Kienböch of Vienna. (5) The dental fluoroscope, a device of Dr. Tousey's for the direct examination of the teeth and jaws with the X ray.

The demonstration was concluded by making and developing two or three X-ray pictures of dental subjects upon bromid paper. This paper yields a completed and permanent picture, and no dark room is required for its development. The picture is finished inside of five minutes, and is excellent for detecting gross lesions such as unerupted teeth. It lacks the beautiful definition which is obtainable with a celluloid film, and is therefore not suited to cases of delicate structural change.

Dr. CLINT W. LASALLE, Rochester. "A New Porcelain Crown."

[This clinic will be found fully described and illustrated in the article "A New Porcelain Crown," printed in this issue of the COSMOS at page 146.]

NATIONAL DENTAL ASSOCIATION.

Ninth Annual Meeting, Buffalo, N. Y., July 25-28, 1905.

General Sessions.

TUESDAY—*First Session.*

THE first general session, which convened at the Y. M. C. A. Building, was called to order at 10.30 A.M., Tuesday, July 25th, by the president, Dr. Waldo E. Boardman, Boston, Mass.

Rev. Wm. C. Wilbur, Buffalo, N. Y., invoked divine blessings on the deliberations of the association.

Dr. C. S. Butler, Buffalo, delivered the address of welcome.

The chairmen of the different sections announced the programs of their respective sections.

Dr. H. J. Burkhart, Batavia, N. Y., chairman of the Executive Council, read the recommendation of the Executive Council regarding the order of program, etc., which was unanimously adopted.

Dr. John I. Hart, New York, N. Y., vice-president for the East, was then called to the chair, and the president, Dr. WALDO E. BOARDMAN, read his annual address, as follows:

PRESIDENT'S ADDRESS.

It is with pleasure that I welcome you, as members of the National Dental Association—a scientific body representing all sections of our country, an organization bringing together men for the interchange of ideas and the advancement of knowledge, not only for the benefit of each of us, but for that of the people at large.

Within this gathering let us by unfettered discussion look at questions from every point of view, by the reconciliation of jealousies and differences, by mutual concession, compromise, fairness, and honesty of purpose, a recognition of mutual rights, forebearance, and human sympathy and charity, ever bearing in mind the axiom, "the greatest good to the greatest number."

The coming together of men of varying degrees of learning, the contact with those of intellect, radically differing in many respects, teach us that professional knowledge and achievement is not centered in oneself alone. We can all profit intellectually, socially, and professionally by entering into the spirit of the occasion.

One reason for our non-success as to recognition with the learned professions is the lack of cultivation and discernment, which our calling justifies. We are what we have made ourselves; if our standing does not rank on the same plane as theology, law, and medicine, it must be due to failure to educate the laity to that standard; and there we will remain until we brush aside contention and strife and cultivate those qualities necessary for our profession to take such rank.

Animated by those sentiments which characterized the action of this association, at its meeting held in St. Louis, in elevating the speaker to the office he now holds, it is the wish that that spirit of unanimity may pervade all its deliberations during this session—believing that here we have an aggregation of men devoted genuinely to its service and sincerely anxious for the preservation of high aims and a fair name. With such sentiments animating the members here assembled, the record of this meeting ought to prove the most honorable and creditable within its history.

But intellectual progress does not include everything, nor does chasing the dollar; there is something more in life. The tendencies toward commercialism in our profession, if not checked, will surely lead to degradation. We want to see this association equal to the new demands of the new days, hence I shall offer a few recommendations for your consideration.

Membership. In his annual address delivered in 1903, President Noel reported a membership of 620; today the treasurer informs me that we have 645. This, however, is too low an average from the 35,000 dentists in the United States. For a national scientific body we should easily show 6000 in lieu of a paltry 645. Why this paucity of members? How shall we increase our membership?

By brushing aside antiquated rules in our constitution; placing in the Council of this association young men of energy and ability, who will bring to it the enthusiasm of youth; by interesting all dentists through our state organizations, by admitting ethical practitioners, whether graduates from colleges or not, and by making this a representative body instead of a delegated organization.

The British Dental Association has 1300 members in a total registration of 4676 dentists in Great Britain, and their requirements for membership are that any reputable practitioner, registered in Great Britain, who practices ethically—upon the recommendation of three members, one of whom shall know the applicant personally—may become a member.

The 1875 Clause. The constitution denies membership to those who have not received a degree from a dental or medical college since 1875. Many practitioners since that date have entered dentistry without that qualification, better fitted to practice than many who have since received a degree. All the states and territories now have laws regulating the practice of dentistry and the examining boards of these several states and territories are well equipped to safeguard the interests of the public and incidentally this association. I therefore recommend the elimination of this absurd clause from the constitution.

Balloting for Delegates. Another clause, referring to the various state and local societies balloting for delegates to represent their respective organizations in this association should be eliminated. These different societies hold meetings at varying seasons of each year, making it impossible to keep track of dates, and more often than otherwise the time has passed before it is known. Unless the representative character of our association takes the place of the delegate system as previously recommended, I suggest that the president and secretary of each society be authorized to issue and sign all delegate certificates, without formal ballot.

There can be no harm in this method, for should any society through these officers send undesirable men to represent it in this association, our organization has the power by investigation or otherwise to prevent their admission, or for expulsion afterward. It is not, however, reasonable to suppose that reputable societies, knowingly, will transgress in any such manner the rules of this association.

The New Constitution of 1903: Sections. The present constitution, being a revision of the old rules adopted at Asheville, N. C., in 1903, known as the "Black amendments," now for the first time in effect, provides separate meetings in three sections instead of six as formerly. What I might say upon this subject can be better expressed by quoting the editor of a well-known dental journal of this country, which quotation fully coincides with my views. He says:

"It has been the opinion of the writer—since the movement toward separate and simultaneous section meetings for the reading of papers and their discussion in our national bodies has gained force—that the old plan in vogue in the American Dental Association was the wisest, and added most to the interest and secured the larger attendance at those meetings. The recent experience at the congress in St. Louis has only confirmed that opinion. If in the profession of dentistry section meetings were demanded, surely the demand and the necessity for the demand would have presented at a World's Dental Congress. Instead of this, the experience at the congress has only shown to the observing that section meetings have signally failed, and that a large majority are opposed to them and desire a less complicated method to arouse and concentrate the interests of all."

The National Dental Association adopted new rules providing for separate meetings in three sections and while it may be said that the new plan has had no trial, yet it is fair to judge of the outcome in the light of recent experience, and that the plan is faulty so far as our profession is concerned. There has been —and we believe always will be—a paucity of interest and attendance in some of such section meetings, and a confusion of wandering interest as to which is the most desirable to attend; so that a positive disadvantage will always be manifest.

Another writer says that it has been correctly stated that in the medical profession, with its long array of specialties, it is appropriate and necessary to have those specialists meet in separate rooms and hold separate sessions; but in our profession specialties are in embryo, and only one, that of orthodontia, can at all be considered a specialty. Even orthodontia can scarcely be so considered when all dental practitioners practice the art, and only less than a score in the whole country of the United States are exclusively engaged in the work.

Three sections, as now provided for in this association, will we believe present the objections to separate section meetings just as prominently as if there were a greater number; and if the old rule in the American Association had been continued and properly lived up to, there would have been no need to ape the methods of medical organizations with large membership in this or any other country. In my opinion the trouble is that the old methods were so poorly lived up to that the new ones had to be broached.

If section officers had but done their duty, and in the afternoon of the first day of meeting had insisted upon the presentation of all papers, and voted as to their merits without discussion, as to whether they should be read before the main body or not; and if the presiding officer of the main body, when such papers were presented, had promptly and positively controlled the proceedings and cut out all the nonsense that presiding officers are disposed to admit, there never would have been any movement for distinct section meetings for the presentation and discussion of papers, and it would have been found in all cases—as it was in some—that there was plenty of time to hear all acceptable papers and the discussion upon them. At the very meeting in Asheville where the separate section meeting rules were adopted, the time was frittered away and the association more than once adjourned because there were no more papers to read.

This brings us to the gist of these remarks, and it is this: At a dental meeting, let those be selected to arrange the program and to preside who think more of their profession and the scientific success of the meeting than of their after-dinner coffee; men who will demand that sessions open promptly, will brush aside extraneous interests, and confine the association to the legitimate business for which it was created. Then we would have less of wondering what had come over the spirit of our National Association, and less of the talk for separate sectional meetings. It ought not to be a physical impossibility for any member to hear all the papers; on the contrary, it should be made possible for every man to hear every paper.

Remedy. The chairmen of the several sections should procure a limited number of papers on the various subjects named in their respective sections, limit them to a certain number of words, say two thousand, the papers to be in their hands a month previous to the meeting. Reject all papers not original in scope, then let each section have a day and evening in general meeting for their papers, or Section I could have the afternoon of the first day; Section II the evening; Section III afternoon of second day; then Section I that evening; Section II next afternoon; Section III that evening, and so on till all papers have been finally presented, reserving the last day for general business of the association.

It is much better to have ten good papers presented in each of the three sections than to have twenty with half of them of questionable value. It is unfair to the essayist to ask him to contribute a paper which may have taken weeks or months in its preparation, and then find the section so crowded that it must be read by title.

Having had considerable correspondence and interviews with others upon this subject since the congress of a year ago, I have found at least ninety per cent. of those who contributed to the work of the congress and of this association diametrically opposed to any more section work for them in this body, and this has been the writer's view since first he became a member of this organization, only to be fully convinced as the years have rolled on.

The meeting should promptly begin on time, and if so carried out I am convinced that the meetings will be better attended and of far greater importance than under the present system. It is with this object in view that he desires this idea tried at the present session, and if it works satisfactorily to the greater body of dentists here assembled, the constitution can then be arranged in accordance therewith.

State and Local Society Delegates. One of the privileges of our constitution is that of inviting state and local organizations to send delegates to the National Association and on presentation of their credentials be made permanent members. This privilege in the past has in some instances been abused by reason of delegates using their state or local society as a vehicle to gain admission into this association, and, once in, of resigning from said state or local society. This injures the state society especially; every ethical dentist ought to be a permanent member of his state organization thereby aiding it and the authorities in upholding and enforcing laws enacted for the good of themselves and the public, likewise assisting the state boards of dental examiners in their sphere of usefulness.

Unless this association be made a representative in lieu of a delegate body, I recommend an amendment to the constitution barring all societies except the state societies from sending delegates to this body, and from whatever cause membership is severed, from that moment they shall cease to be members of this association—with the right, of course, in all cases, of appeal to this body.

Rules for Presiding Officers. It seems to the writer that many of the rules pertaining to the presiding officer might be abolished, for they go so minutely into how and in what manner the president shall preside, that in the short period of one year among his other multitudinous duties, the president has little time for their study; it is utterly impossible for the average man to preside according to the rules as stated. No similar body within my knowledge has so many absurd rules hampering the presiding officer in the discharge of his official duties as this one. The shorter and fewer the rules, the better for an organization where scientific papers and their discussion are considered. The presiding officer should be guided by as few rules as possible consistent with the preservation of order and his own sense of duty.

Publication of the Proceedings. The publication of our proceedings has in recent years been of an exceedingly unsatisfactory character, and it therefore seems wise to move in other directions. Abolish the present method of farming out the Transactions, and in place thereof have a journal of our own modeled on the order of that of the British Dental Association, or the American Medical Association.

Much discussion has been given in committees and in the Executive Council relative to the feasibility of a scheme of publishing our Transactions in a journal of our own, but for various reasons, chiefly the financial, it has failed to materialize. From all information bearing on this question it seems that a scheme might be evolved whereby we could take over the *International Dental Journal*—for I understand it can be had free from all debts or expense to this association—and various dental societies are ready to assist in material and financial resources.

The association should have entire charge of its publication, with a competent editor-in-chief and a business manager, not a dentist, to conduct the business feature of this enterprise. The association should contribute a sum of money from its treasury yearly and such societies as desire to do so may contribute from their respective treasuries to create a fund for the conduct of said journal; those societies contributing to the cause in both, proceedings and financial, to have a free copy mailed to each member of the contributing organizations. In the British Dental Association, each member receives free a copy of the *Journal of the British Dental Association,* published twice a month. In this way the association would have an organ worthy of the name, and the contributing societies would also have a journal of greater merit than now. This would eliminate the question of finance to a great extent in all organizations, and also of the trade journal feature so much abhorred by many practitioners. The publication of the journal, in my opinion, should be in either Boston or New York, preferably the latter.

I therefore recommend and strongly urge that this matter be placed in the hands of a committee with power to act.

Provision for Aged and Infirm Members. We need funds for this purpose instead of allowing worthy and aged members to become paupers and be sent to the almshouses, or allowing them to beg at our homes and offices, on the strength of acquaintanceship with some relative, friend, or preceptor. There should be ways and means provided and a committee of relief formed to take charge of all such cases and see that they are properly cared for.

At its last meeting in Southport, England, the British Dental Association reported thirty-four new subscribers to a fund for various charitable purposes. That association has an invested capital of about ten thousand dollars. Under its benevolent fund during the year ending April 30, 1905, ten dentists received aid as annuitants, mainly aged and infirm members. One who recently died had his funeral expenses allowed. Increase of grant was made and half of debts paid in the case of one annuitant, his friends paying the remainder. Two other dentists were assisted temporarily and twelve widows, annuitants, some with families, were helped. One new case accepted had creeping paralysis. To four daughters of once prosperous men, small annuities were given. Copies of paper on the "Benevolent Fund" were sent to all non-subscribers. One boy elected to St. Anne's Redhill; one girl elected to Wolverhampton. Before these elections they had five boys in homes and orphanages, and one of these passed the junior Cambridge examinations in December last. I recommend that some plan be formulated for the collection of a fund for the purpose above mentioned, to be known as the Benevolent Fund.

Army and Navy or Public Dental Service. The committee on the above deserve great credit for success in having reported to the last session of the Congress a bill providing for dentists in the navy with rank, and I would here suggest and strongly advise that each member write or interview members of Congress within his district, asking them to do all within their power to further the interests of the bill to a successful conclusion.

The writer personally communicated with every representative and senator of his state and induced others to the same effort, so that our representatives in Congress were promptly appealed to to vote for the bill. In all instances replies were returned, nearly all stating that they would do all that was possible for its passage, while several replied that the matter would receive their most earnest attention when the bill comes before Congress for debate. If each member will do the same, no doubt the bill will, at the next session of Congress, be enacted into law.

Branches. It is a singular fact that one of the hardest problems to accomplish is the organization of branches similar to the Southern. For several years the writer has directed energy in that line relative to an Eastern branch, and while aided by good advocates and assistants has failed in infusing enthusiasm. In our profession it does seem that the average person is not broad-minded enough to see beyond his own environment, otherwise the association would be numerically larger. The writer, however, believes that failure is to a certain extent due to the existence of too many dental societies.

Fourth International Dental Congress. This congress has passed into history. Members of the organization committee now realize what it had to contend with from the outset. The misunderstanding between this committee and that appointed on behalf of the Fédération Dentaire Internationale was an unfortunate incident, and was due to the character of the instructions which the latter committee had been directed to carry out. The settlement of the question involved was so long delayed that when final decision was made there was practically but one year for the accomplishment of the object sought, but when the congress opened in St. Louis in August 1904, every detail had been arranged and the success of the venture assured, thus carrying to completion the work of the greatest dental congress ever held. The congress was unfortunate in the selection of the building in which the several sessions were held, but this, however, was not the fault of the committee of organization, for the latter had to adapt its plans to what the Exposition managers freely offered.

Organization and Co-operation of Dental Society Work. Many dental societies fall into ruts, through their officers following in the grooves of their predecessors, their meetings being but insufficiently advertised. It is not what your ancestors have done before you, but what you can and ought to do to enhance your position in life and that of the society you represent. During the past three years the Massachusetts Dental Society has sent out blank applications, postal cards, and programs inviting all ethical dentists of the state to become members. In this way the society has increased two hundred and fifty per cent.—and in the past ten years, four hundred per cent.

If all the state societies could get together in conclave to see what could be accomplished for the enhancement of the work of the National, I venture to predict that this association would increase in membership thirty-fold in a very short time. What an influence it could wield with twenty thousand members on its rolls.

Reciprocity, or Interstate Dental Licenses. The laws of this land provide that no person shall be deprived of the right to earn his living in any state of this Union, yet we have upon the statute-books of nearly each and every state and territory, laws which do precisely that thing. For instance, a dentist in failing health is ordered to a healthier and warmer climate, if he desires to live and regain his health; his financial circumstances are poor, he is a registered dentist in the state where he resides, but having been in practice many years, and on account of his health is not physically able to undertake examination in another state; he is, however, obliged to practice wherever he goes to provide for himself and family. In one state he has been declared competent to practice. Why should he be deprived of the same right in every state of this Union without further examination, provided he pays the license fee? It is logical that if the board in the first instance does its duty by qualifying him for practice in one state of the Union, he should be qualified to practice wherever he chooses without further examination. Where, then, is the justice in subjecting him to a second test? It is evident that the time has come when dental laws in all states should be revised so as to be more in harmony with each other and for the ultimate purpose of interstate reciprocity.

If general reciprocity cannot be obtained, then stronger efforts should be made to bring about interstate reciprocity similar to what has recently been accomplished between the states of New York, New Jersey, and Pennsylvania. It would be well for such states to secure reciprocity with the state or states bounding it, and then the boards, if obliged to carry out the letter of the law, should be lenient on those holding licenses in a distant state. Let this matter come in some manner before this association for action or recommendation.

The Dental Degree. Considerable criticism, some of it harsh and ungenerous, in the past, resulted from the introduction of a new degree in place of the old D.D.S. (I am quoting from one who had much to do with its introduction.) It was not thought best at that period to explain the reason for the change. These reasons, however, were very simple. It was the original expectation of the faculty of that institution to confer the old degree. The writing of a diploma was committed to a professor, the head of the Latin department. Upon investigation it was found that a degree had never been conferred upon dentists by a classical institution.

From a classical standpoint the question was thus a new one. It was also found that the dental college which had originated the degree of D.D.S. (the Baltimore College of Dental Surgery) had written its diploma in Latin, and the degree which it had always given was "Chirurgiæ Dentium Doctor," the proper initials of which would give a C instead of an S with the two D's. It was first proposed to make the degree "Scientiæ Dentium Doctor," so that the initials would remain unchanged, but this would be liable to the same charge of being a new degree; and, moreover, dentistry was not properly a science.

It was decided, finally, to qualify the old degree of "Medicinæ Doctor" by the prefix "Dentariæ," and thus at the same time meet the classical requirements and give what seemed a proper and distinctive title. There was no thought of the faculty of the institution originating the degree arrogating to themselves any special superiority or claim of exclusiveness. Further, it was expected that the new degree would approve itself to other universities which might have dental departments, and thus gradually become the accepted degree. That such has not been the universal result is no fault of the originating university. The degree was recommended by vote of the faculty on February 16, 1869, and on February

27th the corporation established this degree.

Since then several colleges have adopted it or changed from the old to the new. Among these institutions are found the San Francisco Dental College and Tufts Dental College. May it not be well for this association to take up this matter of degrees and recommend the adoption of the same in all the dental institutions of this country?—thus unifying all and promoting harmony.

Life Membership. Would it not be well to establish a life membership fund of say twenty-five dollars or upward, the fund to be safely invested and the income to be used for any wise purpose at the discretion of the association? This would make a more stable organization, another means of securing a permanent fund, and another method of increasing membership that might prove of greater benefit than we now anticipate. With a membership of 645, each of you can readily figure a goodly sum for investment, even if all did not desire life membership. This would eliminate the question of dues to those who do not care to pay yearly and who often allow them to lapse from neglect or otherwise, but who would be glad to remain members with this item forever banished.

The interest on the sum invested would be of assistance to the benevolent fund heretofore mentioned, or to the publication of the journal, or for other useful purposes which the association desired to promote.

Identification by the Teeth. Much has appeared in the journals on identification of the teeth of missing relatives and friends when found after death from disaster. Without going into this matter at length, I suggest that the committee on Oral Hygiene again take the subject in hand.

Confliction of Dates of State Meetings. The dental journals have recently contained much in relation to conflict of dates in state meetings. I would also suggest, if feasible, that the Committee on State and Local Societies give this subject attention to see what can be done to remedy this confliction. I realize that this is a matter of great magnitude, however, but something may be accomplished in this line if the committee will put energy into the work.

The British Dental Association extended an invitation to meet with them in Southport, England, May 20 to 23, 1905. This invitation was, on behalf of this association, accepted in a suitable letter by your president, and six delegates were appointed in due course to represent this organization.

In closing I desire to express my appreciation to the several section and clinic officers, and all others who have contributed to the success of this ninth annual meeting, and my hearty congratulations for the splendid support and enthusiasm given me in the preparation of the program, together with their uniform courtesy and expression of goodwill toward the writer during our official relations.

On motion by Dr. Charles McManus, the President's address was referred to a committee of three, to be reported on at a future meeting.

The motion was carried, and the chair appointed the following as such committee: Drs. Chas. McManus, Hartford, Conn.; Wm. Potter, Boston, Mass.; and Eugene H. Smith, Boston, Mass.

Dr. Burkhart then called attention to an amendment to the constitution and by-laws, notice of which was given last year, and which is as follows: "An amendment to the constitution and bylaws, changing the basis of representation in the association from 'all regularly organized societies' to 'only state societies'," and moved its adoption.

The motion being supported was discussed by Drs. Diedel, Burkhart, Finley, London, Crouse, Donnally, Butler, Hinman, Bryant, Conrad, and Ottolengui, who offered an amendment to Dr. Burkhart's motion so as to read: "Only delegates shall be accepted from duly authorized state and territorial dental societies, except in the District of Columbia, and two associations from there having already been recognized, their delegates shall be received."

The amendment was lost by vote, and

the original motion being put to vote was carried. The chair then announced that delegate members in the future will be restricted to regularly organized state and territorial societies.

The report of the Committee on History was read by Dr. CHARLES McMANUS, Hartford, Conn., as follows:

REPORT OF COMMITTEE ON HISTORY.

Buffalo, N. Y., July 26, 1905.

To the National Dental Association:

Your Committee on History begs leave to submit the following proposition:

For the past several years Dr. Vincenzo Guerini of Naples, Italy, has been compiling a history of dentistry from the earliest records down to the nineteenth century. The historical period covered by Dr. Guerini is of the utmost importance, in that it represents the basis upon which the superstructure of modern professional dentistry has been erected. Those of us who have been accustomed to regard dentistry as a modern art can have but little idea of the extent to which we are indebted to those of the middle ages, and earlier, for much that is woven into the fabric of our modern practice. The collecting and harmonizing of the data for this early historical record has been a labor of many years, by an expert specialist, and is now submitted in the English language ready for publication by its distinguished author. It has been his desire that the work shall make its first appearance in English and under American auspices.

Your committee has examined this work, and is of opinion that the National Dental Association should secure the honor of publishing this history by undertaking to guarantee the sale of a sufficient number of copies to practically cover the cost.

Your committee finds that it will be necessary to fix the retail price of the work, fully illustrated and bound in cloth, at five dollars, and that in order to guarantee the cost of an edition of 1000 copies it will require 700 subscriptions at five dollars each to insure a fund of $3500, to pay the cost of publication.

We would suggest that the association assume publication of this work, with the understanding that the book shall not be published until not less than 700 subscriptions shall have been received for it. Further, that the treasurer be authorized to receive subscriptions, and that your Committee on History be authorized to solicit subscriptions and to attend to the details of carrying the work through the press.

The conditions surrounding this proposition are such as to require your immediate action, if this association and the dental profession of America are to achieve the honor of bringing out this unique work.

The utmost asked for by your committee in the foregoing proposition is the moral support of your honorable body in carrying to a successful issue a most important phase of the work for which the Committee on History was created, and to that end we ask for favorable action upon the proposition herein embodied.

For the committee:
[Signed] E. C. KIRK,
WM. H. TRUEMAN,
BURTON LEE THORPE,
CHAS. McMANUS, *Chairman.*

The report of the Committee on History was referred to the Executive Council.

Dr. ROBERT T. OLIVER, U. S. Army Dental Surgeon, West Point, N. Y., then read a paper on "Three Years' Service in the Philippines," of which the following is an abstract:

THREE YEARS' SERVICE IN THE PHILIPPINES.

The creation of the Army Dental Corps by act of Congress, February 2, 1901, the organization of its board of examiners, the duties of said board in Washington, and the subsequent history of the corps, are too well known to necessitate further information of a general character. Therefore, I shall confine myself to a brief *résumé* of the history of that portion of the corps who saw pioneer service during its first foreign tour of three years in the Philippine Islands.

You will remember that one of the provisions of the act creating the corps was to the effect that those members of the Hospital Corps, U. S. army, who were graduates of dentistry and had been detailed as dentists for at least one year prior to the passage of the act were to be admitted to the corps without examination. This provision gave us five men almost from the start, they being located in the Philippine Islands. As the bulk of our army (over sixty thousand men) were at that time on duty in the Philippine Islands, it became very apparent early in our career that the majority of our successful candidates would have to proceed to the islands for duty by their first order. This proved to be the case, and our first eleven candidates were ordered to report to the commanding general, division of the Philippines, for assignment to duty, which gave us sixteen men in the then active territorial division of the army where their services were most needed.

When my order was issued August 1st to proceed to Manila, I was ready and eager for it. In making my last call upon the Acting Surgeon-general prior to my departure from Washington, I was informed that I would be expected "to organize and maintain the corps upon a good working basis to the needs of the division, then in a state of war."

Upon arrival I found that of the sixteen dental surgeons in the islands, only ten had the necessary outfits, and these only partially complete. The five who were appointed from the Hospital Corps were still using their personal outfits, more or less complete, and one recent arrival was doing his best at a small station in Laguna province with the small dental case furnished to the medical department.

All these men were stationed at various towns throughout the provinces then under American occupation, and on account of the large number of troops demanding their attention it had become necessary to change them from time to time to different stations and localities, so as to better meet the requirements for dental treatment. I was surprised to find that before my arrival more was demanded of dental surgeons than could possibly be accomplished by them. They had often been sent to one- or even two-company posts with instructions to complete all dental work necessary there in from five to ten days' time—an utter impossibility. It therefore became necessary to divide the number of dental surgeons and send a sufficient number to the different brigades *pro rata* to the strength of those brigades, and request orders directing them to remain at stations a sufficient length of time to accomplish some good in the way of tooth-conservation, as well as relief from pain, which we termed "emergency treatment."

At this time the division of the Philippines was divided into the department of North Philippines, containing the 1st, 2d, 3d, and 4th brigades; and the department of South Philippines, containing the 5th, 6th, and 7th brigades. The new assignments requested were as follows: *Department of North Philippines*—1st brigade, 3 dental surgeons; 2d brigade, 2 dental surgeons; 3d brigade, 3 dental surgeons; 4th brigade, 2 dental surgeons. *Department of South Philippines*—5th brigade, 2 dental surgeons; 6th brigade, 1 dental surgeon; 7th brigade, 2 dental surgeons; with two including myself, in the city of Manila.

There being an active state of insurrection in the islands, it was necessary for the army to be distributed to a vast number of small stations throughout the archipelago, and while it was not the endeavor to send a dental surgeon to each and every station, it was, as far as practicable, determined to send one to each important station of the territory, where he would be located for periods of time averaging about two weeks, during which time he operated for all cases requiring his services and received dental patients from adjacent smaller commands. This itinerant service of dental surgeons was carried out during the entire three years of my service in the Philippine Islands for the reason stated at the time it was inaugurated, in the fall of 1901, to wit: "That the greatest benefit to the greatest number could be accomplished by sending dental surgeons to stations throughout the departments, instead of having patients sent to the dental surgeon at some centrally located station of his territory."

The original plan, however, was modified to a certain extent by division orders issued the first of the year 1903, which directed dental surgeons to visit only a certain number of the large stations throughout the territory assigned them, creating sub-stations of the smaller commands and requiring dental patients to be sent to the dental surgeon at his nearest regular station, in charge of a non-commissioned officer, on such dates as may have been previously arranged for between the dental surgeon and the commanding officer. This plan resulted in very material benefit to all concerned, and gave greater time for dental surgeons to practice a more conservative treatment, eliminating the loss of time necessary to the packing, repacking, and unpacking of outfits awaiting and during transportation, as shown by previous records, when all stations were visited. All dental surgeons except those on duty at base stations made itineraries throughout their respective departments.

After the declaration of peace, July 4, 1902, the policy of the army was to largely decrease the number of stations throughout the islands, which of course made it somewhat easier for the dental surgeons of the several departments. And while we had one hundred and forty-odd stations to be visited by the sixteen dental surgeons when first I arrived in the Philippines, or until July 1902, the number was so decreased that there were less than fifty to be visited at the time of my departure in October 1904.

TRANSPORTATION FACILITIES.

The transportation of dental surgeons with their assistants and complete portable outfits was an important factor for consideration in the division at all times, and it frequently became necessary to take steps to insure safety from molestation by marauding bands of *insurrectos.* In the early days it was not uncommon for the dental surgeon with his assistant and outfit to travel among the various stations of his itinerary in the mountain districts per pack-train, with an escort of armed men for protection, and on many occasions it has been necessary for them to travel from one station to another between different islands aboard native sailing *praos,* those peculiar, rough-hewn, knife-blade-shaped canoes with the large picturesque bamboo outriggers. Later on, transportation became safe by escort or light quartermaster wagon, and sometimes, when available, by the Manila and Dagupan Railroad, with the very frequent use of chartered inter-island transports of the army.

FIELD EQUIPMENT.

The portable outfit comprising our field equipment is very compact, complete, and admirably adapted for the peculiar character of service required in the Philippines. This outfit is capable of being packed in four chests and two crates; one crate containing the take-down chair and its equipment; one chest, "Dental instrument chest No. 1," containing all operating dental instruments and appliances, each placed in a separate compartment in the trays of the chest, made especially to fit it, to prevent rattling in transportation. The second chest, designated "Dental instrument chest No. 2," contained the various articles of supplies; and the "Dental engine chest," for the engine and its equipment. The contents of these chests embrace everything essential to a first-class practice of field operative dentistry.

DENTAL BASE STATIONS.

It soon became apparent that other treatment than operative would be necessary, and as it was absolutely impracticable to attempt to carry a laboratory outfit sufficient to attempt prosthetic operations, I formulated a plan, which was approved by the chief surgeon of the division, of creating what I was pleased to term "base stations," which were to be placed in charge of the most competent dental surgeons and equipped with complete laboratory outfits, so that all prosthetic cases resulting from a soldier's loss of teeth in the line of duty could be handled at these stations in addition to the operative cases of the locality.

The first one, "Dental base station No. 1," was opened at the First Reserve Hospital, Manila, P. I., early in March 1902. It was contemplated that all prosthetic cases occurring throughout the department of North Philippines would be transferred to this station for necessary treatment. Another, designated "Dental base station No. 2" was at the headquarters of the department of South Philippines, in Cebu, and was supposed to attend to all prosthetic cases of its respective department. Later on, when the reorganization of the division in October 1902 provided for three departments, viz, department of Luzon, department of the Visayas, and department of Mindanao, the dental base station No. 2, heretofore located at Cebu, was transferred to Iloilo, the headquarters of the new department of the Visayas; and another new one, "Dental base station No. 3," was opened at Zamboanga for the department of Mindanao. It was also contemplated that at dental base station No. 1 the oral surgical cases coming within the jurisdiction of all department dental surgeons were to receive necessary operation or treatment, and instructions were sent to dental surgeons throughout the archipelago to have all such cases transferred to Manila for said purpose.

OFFICE ACCOMMODATIONS.

As a rule, dental surgeons were given the best room available for their operations at the various stations of their itinerary. Usually this has been part of a hospital, although it had not been uncommon for rooms to have been assigned for this purpose at the offices of quartermasters, or even commanding officers, where better operating light was available. In the early days, however, dental surgeons making the various stations throughout the active area of operations have been compelled to locate their offices in the various churches and monasteries of the small towns, and often in *nipa* shacks, closely adjacent to the hospitals or guardhouses for protection. On the islands of Samar, Luzon, and Mindanao, where troops have been encamped in the field distant from towns, dental surgeons have frequently been compelled to use tents for office purposes. While much good was derived by the commands from emergency treatment received at these offices under canvas, it was clearly demonstrated that a tent was a very poor and unsatisfactory place for dental operations —first, on account of the difficulty in securing proper light, which was either a too direct sunlight and consequently very hot, or else was diffused from the top canvas and cast false shadows in the oral cavity. It was also found impossible to keep the delicate instruments from rusting, on account of the moisture arising from the ground, as well as that which beat through the roof during tropical downpours.

At home stations it was frequently the rule to assign a house to the dental surgeon large enough to be used as an office and for living quarters. This plan proved very satisfactory when carried out, but unfortunately less than twenty-five per cent. of commanding officers conformed to it. At Camp McGrath, near Batangas, Batangas province, where two squadrons of the 12th Cavalry were stationed, the commanding officer had a building specially constructed for a dental office from plans submitted by the dental surgeon then on duty there. This exemplary action of the regimental commander was greatly appreciated by the corps, and it was hoped it might establish a precedent that would result in the same action being taken at other important large stations in the Philippine division. In the spring of 1903 a letter was written to the adjutant-general of the division recommending "that adequate provision be made for the construction of suitable offices and operating rooms for the use of dental surgeons at each army post then building or under contemplated construction in the Philippine division, early advantage thus to be taken in securing ample space, a north operating light, convenient laboratory, supply lockers, etc." Nothing official was ever heard of this communication, however; consequently no action, as far as known, has ever been taken toward providing suitable offices for dental surgeons, except as above indicated at Batangas.

SUPPLY STOCK.

One of the first important things that was found necessary after arrival at Manila was to secure a full and adequate stock of dental instruments and supplies from which dental surgeons could replenish when necessary. This was accomplished in time, and a large storeroom set aside in the Manila medical supply depot for this purpose. Upon arrival of the first large consignment of stock, it was carefully placed upon perfectly dry shelves in a well-ventilated storeroom, and no doubt when placed there was in good condition, but after a few weeks it was observed that a tropical climate demanded new things in the way of preservation of instruments than any to which we had ever before been accustomed. Such delicate instruments as root-canal cleansers, broaches, drills, explorers, separating files, Kaeber saw-blades, flexible probes, burs, etc., were found to be so corroded with rust as in many cases to be unserviceable; and the larger operating instruments were also found to be in bad condition from the same cause. The Surgeon-general was advised of the peculiar destructive effect of the climate upon these instruments, and it was recommended that the various supply dealers throughout the country who furnished instruments for our corps be directed to wrap all larger instruments in wax paper carefully twisted at each end, and to take such care of the smaller instruments by dipping in wax or rolling in albolene and corking in small sealed phials as was deemed necessary. After this, very little trouble was experienced in the care of instruments comprising the dental supply stock of the division.

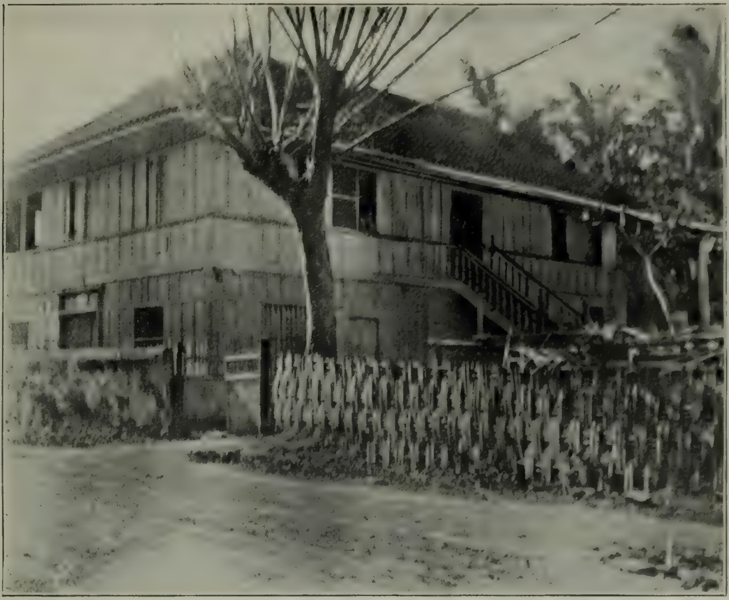
ASSIGNMENTS.

The assignment of dental surgeons to duty, and the entire management of the corps in the Philippine division, was controlled by the supervising dental surgeon under the direction of the chief surgeon of the division until August 9, 1903, when during his absence on sick leave in Japan at that time, general orders from the division of the Philippines were published, directing that dental surgeons then on duty in several departments should report by letter to the commanding generals of the respective departments for assignment to duty. This inaugurated a change in the control of dental surgeons, reverting to the chief surgeons of departments, which did not at first produce beneficial results on account of the unfamiliarity of medical officers with the technicalities of this particular branch of the service. Their errors of judgment in regard to length of time required for dental treatment of commands at various stations, the character of treatment necessary, and the many other things dependent upon a technical knowledge of dental surgery, were early manifested, and, although subsequently corrected as soon as understood, it must be stated that the character of our corps service was not maintained at the standard previously prescribed, as there seemed to be an idea prevailing with chief surgeons of departments to eliminate as much as possible the lengthy treatment of teeth often necessary to save them, as well as the insertion of fillings of a permanent character.

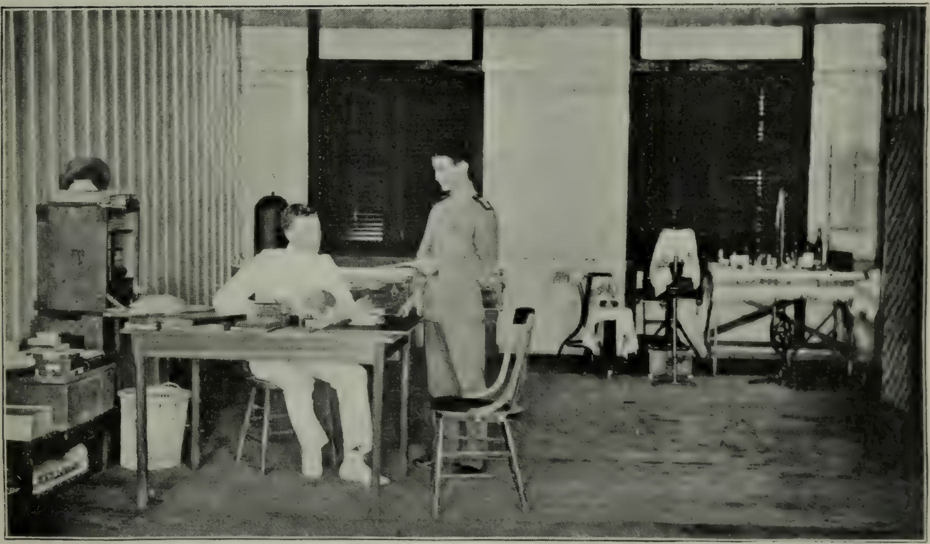
This plan was advocated, no doubt, in order that the dental surgeons could give some emergency service at a larger number of stations, and then proceed in all haste to the next station to continue the same unsatisfactory methods. In this connection it seems pertinent to quote the following from a letter of instruction sent by the chief surgeon of a department to all dental surgeons of his department, under date of August 22, 1903, to wit:

> In view of the large amount of dental work needed in the departments and the limited number of dental surgeons, it is necessary that their operations be expedited as much as possible. It is therefore directed that none but emergency work be done at the several stations; protracted treatment with the hope of ultimately saving a tooth being considered one of the main causes of delay in dental work.

This instruction given to the dental surgeons on duty in that department was not consistent with the main object of the creation of the dental corps, and certainly was in contradiction to instructions issued by the supervising dental surgeon



Exterior view of office at Cebu, May 1902.



Interior view of office at Zamboanga, Mindanao, May 1902.

eight months previously, under date of January 14, 1903, as follows:

> Since the great reduction and concentration of troops in this division due to the reorganization, it is contemplated that increased length of time at stations will give greater opportunities for tooth-conservation, permitting more extended treatment in cases of pyorrhea alveolaris, dento-alveolar abscess, putrescent root-canals, chronic pulpitis, pericementitis, gingivitis, etc., and for permanent filling of all morsal surface cavities and cavities compounding morsal surfaces (in bicuspid and molar teeth) with metal, and the filling of incisor and canine teeth with gold when the consent of the patient permits. It is desired that hereafter efforts be made to finish all dental treatment required in the mouth of each patient, and it is recommended that all emergency cases be taken early each day in order that sufficient time can thus be obtained, later, to give operative cases the required attention.

It will be observed that the tenor of the two letters was diametrically opposed, and it can be imagined with what confusion this department chief surgeon's instruction was received by the dental surgeons on duty in that department, who had previously been instructed from a professional standpoint, as already related. This condition of affairs governing the dental treatment of the division continued for about three months, when the error became so apparent that the above-quoted instructions were of necessity modified, and it was finally arranged that in all matters having a professional bearing or requiring a technical knowledge the instructions should be issued by the supervising dental surgeon, leaving the assignments, per official orders, still in the hands of the department chief surgeons.

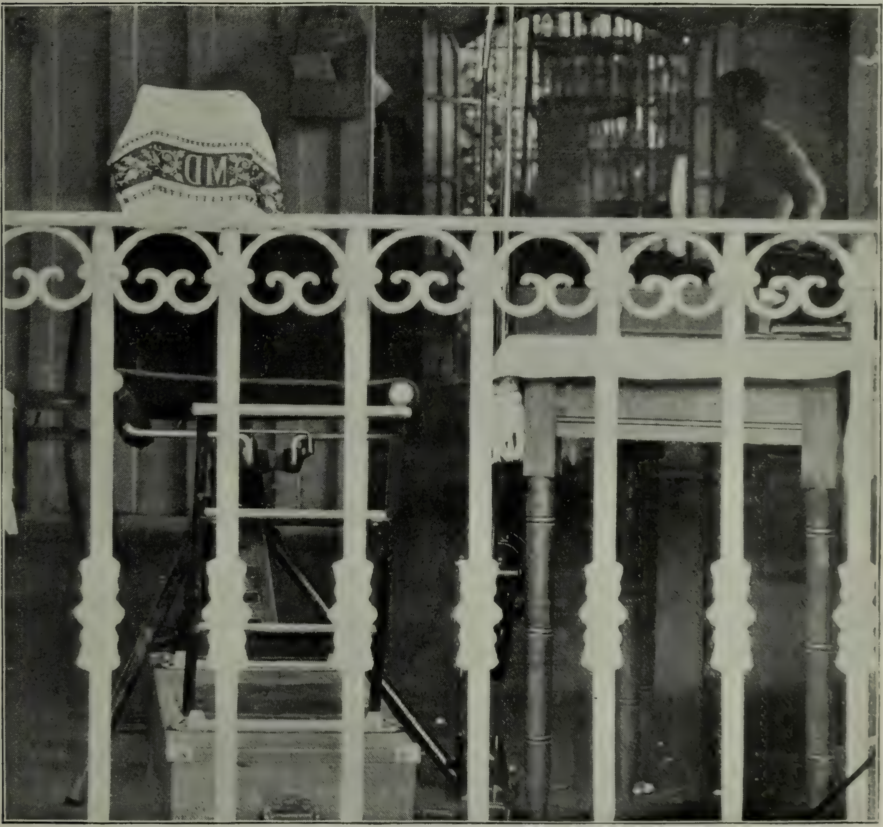
CHARACTER OF SERVICE.

The general efficiency of the corps service was highly appreciated and satisfactory to all concerned. The value of their services in relieving acute suffering for the thousands of men treated, the preservation of the vast number of teeth, the restoration of mouths to a healthy condition and the consequent return of patients to a fit condition for martial duty, is a great factor that should not be overlooked when considering the matter of a permanent and adequate organization of the corps in the regular establishment of the army. The numbers of men whose efficiency as soldiers has been materially benefited by prophylactic treatment, and the maintenance of a hygienic condition of the oral cavity, incidentally improving the entire digestive tract, have been well worth the total expense of the corps. Many cases of gastro-intestinal disease which for greater or less periods of time have been augmented by the ingestion of pyogenic bacteria have been benefited by the elimination of diseased oral conditions. Many oral surgical cases, such as fractured jaws, necrosis of bone, caries of bone, impacted third molars, empyema of the maxillary sinus, ranula, ex-section of nerve trunks, ex-section of jaws, etc., have also been treated in the division. These operations, coming within the jurisdiction of our specialists, have been greatly appreciated by all medical officers who have been fortunate enough to observe them. Of all oral surgical operations performed at dental base station No. 1, Manila, there have resulted one hundred per cent. of cures.

When it is considered that the effective service of the medical department of the army has been so greatly augmented and increased by the addition of a corps of specialists in dental and oral surgery, who have undoubtedly furnished additional luster to the glory already attained by that important department, it would seem that, in appreciation of such service, every effort should be made by the medical and dental professions of the country, as well as the army itself, to incorporate this corps of specialists into said department upon such a permanent basis as to encourage and stimulate the corps to its greatest efficiency, thereby giving the professional efficiency of the medical department of the United States army a greater scope in its health-saving duties than ever heretofore.

Originally it was not contemplated to render any service for native troops; in fact, those valuable adjuncts of the army, the Philippine scouts, seemed to have been lost sight of entirely as far as the dental corps was concerned. It was only

Exterior view of office at Zamboanga, Mindanao, May 1902.



Interior view of office at Iloilo, Panay, June 1902.

a matter of six months, however, till it was manifestly apparent that some service of a dental character must be given them. Owing to the small number of dental surgeons on duty in the islands at that time, it was considered inexpedient to extend dental service to the Philippine scouts except that actually necessary for the alleviation of pain, to wit: extraction of teeth, medicinal treatment of teeth, lancing of abscesses, etc., and this only at such stations visited by the dental surgeon as contained native in addition to American troops, or at such sub-stations immediately adjacent to a post regularly visited by a dental surgeon. During the last year, however, the demands for dental treatment by the native troops, which numbered approximately five thousand, have steadily increased, which tends to show the marvelous effects of higher attainments in education, as well as their general aptness in following the later ideas of civilization brought over by the Americans. In a few instances, however, notably those stationed at Caloocan, a suburban city of Manila, native troops have been given a more conservative treatment by the dental surgeons located in Manila.

The kind of treatment rendered for officers may be said to differ materially from that usually rendered for the enlisted men of the army in this respect. Due consideration has been given to the fact that officers are permanent members of the army to whom it was essential they should receive the most permanent and conservative treatment—gold fillings, crowns, bridge work, etc.—whereas the enlisted men largely are only temporary units of the army whose services can only be counted on for a period of three years, or during their first enlistment, statistics showing that the majority of the enlisted *personnel* of the army only remain during one enlistment.

At the larger posts throughout the division, where dental surgeons had opportunities for operating a considerable period of time, the character of dental service was based upon the standpoint of our greatest professional efficiency—*i.e.* tooth-conservation; but at the smaller stations, where the dental surgeon was located for a short period of time, it was of necessity based upon emergency treatment, in order that the greatest number of men could obtain the benefits of dental treatment during the limited period. This unfortunate condition of affairs is more or less to be regretted, as it is considered only fair that every soldier should have equal opportunity of having his teeth filled and saved, especially when he is detailed for duty at remote stations in the Philippine Islands, where it is absolutely impossible to obtain dental treatment from civilian dentists, even at his own expense.

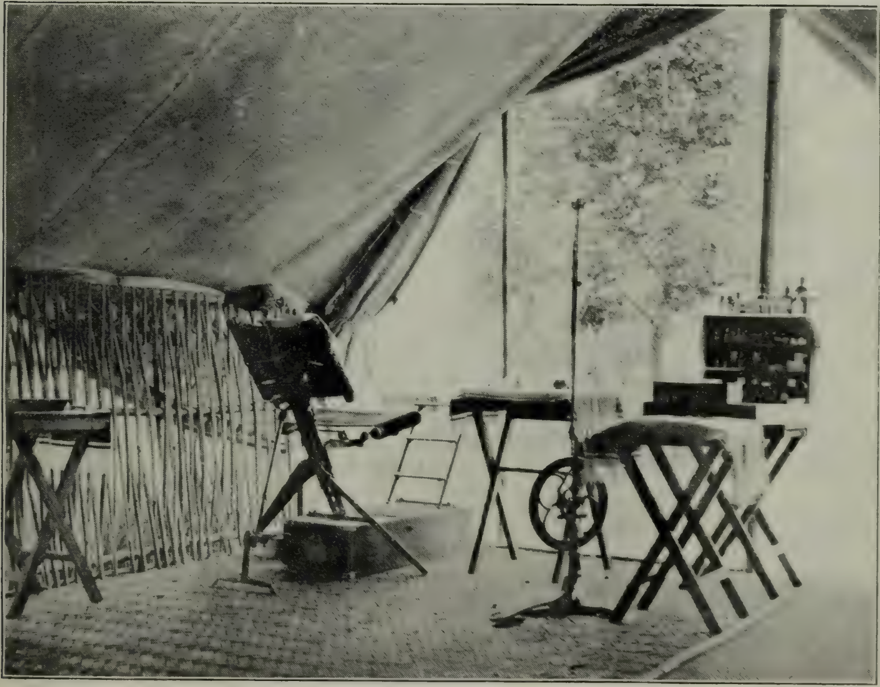
That our corps has filled a long-felt want and has come to stay is the expression of almost all officers who have had opportunities of considering its great work in the Philippine Islands.

The following extract, taken from the chief surgeon's annual report, dated Manila, P. I., June 30, 1904, tends to indicate what this high-ranking medical officer thinks of the services performed by the dental surgeons during the year:

> The services performed by the contract dental surgeons on duty in the division have unquestionably benefited the general health and comfort of the commands. Climatic conditions are more conducive to the inception of oral diseases, especially to the inroads of dental caries, than is the case in the United States. The work accomplished is restricted by the long distances to be traversed, by the limited number of dental surgeons, and the time lost in making change of stations. The larger posts are well attended to, but the smaller stations suffer somewhat. The relatively short periods available for staying at each station in the itinerary have in many cases rendered conservative operations impracticable and confined all dental work to emergency treatment.

It is very hard for one unfamiliar with the amount of service rendered during our tour in the Philippines to appreciate the wholesome amount of good our corps has accomplished, unless the matter is put directly to them from a professional standpoint, with kinds of cases and numbers of each presented and operated upon. It is therefore with feelings of justifiable pride that I invite your attention to the following table

Dental offices under canvas at Camp Weyler, Samar. April 1902.



At Camp Stotsenberg, Luzon, June 1903.

representing the total number of cases presented and operations performed by our corps in the Philippine Islands during my service there. The results obtained therein are an honor to our noble profession, as they certainly create the world's record of dental service, for never before has there been an equal number of dental surgeons banded together in one organization working toward a common end.

SERVICES RENDERED.

Cases presented.

Abrasion, mechanical	87
Abscesses of the jaws	91
Bridges, defective	19
Calcification of the pulp	10
Caries of the alveolar process	4
" " " jaw	1
" " " teeth	55,567
Crowns, defective	12
Cysts of jaws	11
Dento-alveolar abscess	3,733
Dentures, broken	17
Devitalized pulp	395
Edentulous jaws	32
" jaw (partial)	284
Empyema of the antrum	36
Erosion, chemical	64
Eruption, painful	11
Fillings, defective	143
Fracture of the alveolar process	2
" " " jaws	40
" " " teeth	212
Gangrene of the gums	1
Gingivitis, acute	636
" ulcerative	16
Hemorrhage (secondary), following extraction	22
Hypertrophy of the gums	105
" " " pulp	39
Hypercementosis	46
Impacted teeth	47
Mal-eruption	3
Necrosis of the alveolar process	12
" " " jaws	39
" " " teeth	1,262
Neuralgia (trifacial)	29
Odontalgia	16
Orthodontia	42
Ostitis	1
Periostitis	17
Pericementitis, acute	481
" chronic	431
Pulpitis, acute	3,811
" chronic	2,168
Pulp-nodules	2
Putrescent pulp	287
" root-canals	225
Ptyalism, mercurial	3
Pyorrhea alveolaris	663
Recession of the gums	20
Resorption of the alveolar process	82
" " " gums	1
Retarded eruption	6
Salivary deposits	6,454
Sensitive dentin	60
Stomatitis, acute	83
" syphilitic	2
" ulcerative	56
Sub-periosteal abscess	1
Supernumerary teeth	7
Trismus	1
Tumors of the gums	3
Minor miscellaneous cases	631
Total	78.587

Operations performed.

Abscesses lanced	360
Amputation of roots	5
Bridges	194
Bridges reset	45
Calculus removed	6,464
Cauterization	7
Crowns	1,055
" reset	35
Dentures, full	37
" partial	286
" repaired	25
Defective crowns removed	1
Dentures, teeth reset	6
Exsection of the jaw	1
Exsection of nerve trunk	1
Fillings, amalgam	21,816
" combination	1,034
" defective, removed	46
" gold	4,211
" gutta-percha	2,220
" oxyphosphate	11,692
" tin	42
Gums excised	45
Local treatment (gums)	172
Operations for empyema	8
" " ranula	1
" " reduction of fracture	22
" " trismus	1
Pulp devitalized	4,036
" extirpated	3,493
Root-canals filled	4,049
Surgical removal of necrosed bone	1
" " " " process	1
Surgical treatment for stomatitis	7
Teeth extracted	12,844
" treated	7,991
Treatment of fractured jaws	17
Minor miscellaneous operations	290
Tooth replanted	1
Total	82,562

Aggregates.

Grand total—Cases presented	78,587
" " Operations performed	82,562
" " Patients treated	30.262

ORAL CONDITIONS.

Judging from the kind of cases first presented it could be easily seen that the vast majority of soldiers had never known what dental attention was, as the neglected condition of their mouths and teeth indicated beyond all doubt that the individual had paid very little or no attention to the welfare of these important organs. When we consider that there were probably sixty thousand troops in the Philippines at that time, a majority of whom had been on duty in the tropics for about two years with no possibility at hand of obtaining dental treatment from civilians or otherwise, and with the manifold effects of the tropics, character of food, and continuous active service against a wary foe, which prevented even the ordinary care to their personal toilet, it can be imagined what condition the mouths of these men presented. It was soon found that between eighty and ninety per cent. of the commands required dental attention, that few of the men ever made an attempt to clean their teeth, that probably twenty per cent. did make an effort, when in permanent camp or barracks, and that the great majority of those who came to the dental surgeon were found to be habitually affected with one or more of the following conditions and frequently a combination of several: Very foul breath, dark reddish brown stain on the teeth, thick salivary calculus with turgid congested gums, an acute or chronic gingivitis, marked recession of gums, some form of stomatitis, pyorrhea alveolaris, and frequently exaggerated conditions of caries and pulpitis, often accompanied by acute odontalgia.

The need for dental treatment was especially noted as being greater for those men recently returned from active campaigning in the field. There are many reasons incident to active service, such as lack of opportunity, scant water supply, entire time filled with martial duties, constant alertness for the enemy and in self-preservation, with the loss of inclination to appear anything but the real fighting machine which rendered it almost impossible for a soldier to give even the ordinary care to his person, much less any hygienic attention to his mouth or teeth.

This neglect, often accompanied by the direct local effects and indirect systemic effects of poorly cooked food upon the oral tissues, together with a general loss of tone due to fatigue and the rigorous tropical climate, were prominent etiologic factors in the foregoing pathological conditions mentioned.

Of all the cases that came under observation of dental surgeons during our three years' tour, it is a noteworthy fact that not a single case of true scurvy was discovered, which speaks volumes in behalf of the excellence of the field rations furnished by our government.

In this connection I may say that the oft-quoted statement of the terrible tropical effects upon the teeth and gums is a mistake, as tropical effects are only incidental and can be traced to a general loss of tone in the individual and the consequent lessening of nutritive activity. One of the most common indications of this effect on soldiers who have been on duty in the tropics for periods of time over one year is demonstrated in the capping of pulps, a procedure which now, since experience has taught us, is never attempted with any assurance of success for officers and men of the army who are undergoing the arduous duties incident to their occupation.

EXAMINATIONS.

During my three years' tour of duty in Manila there have only been three classes of candidates ordered to report for examination, of which number none qualified; the cause of these failures apparently being that the candidates in all cases had been away from their text-books for a considerable length of time, some of them occupied with other duties than those of a professional character, consequently their opportunities for a thorough review were almost an impossibility.

PROFESSIONAL OBSERVATIONS.

In addition to service directly connected with the Army Dental Corps, it has been my privilege to observe many other things from a professional standpoint that no doubt will be of interest to you. It was noticed early that great numbers of the natives throughout the islands are confirmed *buyo* or betel-nut chewers. Buyo is nothing more than a thin cross section of the betel-nut, which in section looks similar to a section of a small lemon. On this slice of betel-nut they sprinkle a plentiful supply of lime, then skilfully roll the entire mass in a long narrow green leaf similar in appearance to the peach leaf. This is then introduced into the mouth and usually kept stationary on one side along the buccal surfaces of the molars, and is pressed from time to time to extract the juice. The appearance of a buyo-chewer's teeth is peculiar to itself, the teeth look as if slightly coated with dark red lacquer; all concretions of tartar also having the dark red stain. The gums usually are tumefied and often separated from the teeth, frequently presenting the loosened condition following mercurial ptyalism. It took me quite a while to finally settle in my mind just what the odor of a buyo-chewer's breath resembled, but I finally fixed upon it as being identical in odor to that of partially consumed acetylene gas.

Many tribes of Filipinos have remarkable ideas about personal adornment and teeth-decoration. Some of the Tagalos in Manila go to native dentists and have what are termed "dental ornaments" placed between their front teeth. These are usually small appliances made very similar to the ordinary paper fastener, except that they are made of gold, with a circular piece in front terminating in two long tangs behind, which lie very closely together to facilitate insertion between the incisors. The tangs are then opened laterally upon the lingual surface, so as to hold the ornaments in position.

The Iggorote and Negrito tribes of northwestern Luzon take special delight in filing their front teeth to a point. This is done by files to begin with, if they can be found, afterward using a small square section of stone to wear away the enamel and dentin. Teeth treated in this manner present a very peculiar appearance with nothing but single sharp pointed cusps left where the broad incisal edges should be. Some of the southern tribes, particularly the Moros, have a way of staining their teeth black, and have adopted a very ingenuous method of causing the dark stain to "stay put." They begin with a rough stone, often the same one with which they sharpen their bolos and creeses, rubbing the labial surfaces of the centrals, laterals, and canines, both superior and inferior, until they have worn away the entire surface of the enamel and well into the dentin, leaving a concave labial surface to the tooth. They then begin their preparation of applying the stain, which is readily absorbed into the dentin to a greater or less extent, giving it a permanent dye. I have been informed that this dye is made as follows:

They first select a green cocoanut, about two-thirds ripe, and after removing the husk covering, carefully cut off the top cap portion, preserving the milk and unripe meat intact. They then take a mass of soft iron filings, about half a teacupful, and pour this into the cocoanut. The iron filings are acted upon apparently by acids of the milk in such a way as to greatly oxidize it after having been set aside for a matter of a week or ten days. When applied the liquid has evaporated to a rather thick inky consistence and has a very dark bronze color. The surfaces of the teeth are then dried and painted over with this liquid, using a small bamboo stick which has been chewed to a brush-end for this purpose. Many applications, covering a period of sometimes several days, are necessary before the final dark bronze-black is obtained, and frequent re-applications are necessary at intervals, to keep the desired shade.

PHILIPPINE DENTAL LAW.

During the fall of 1902 the Philippine Civil Commission took up for consideration the matter of a suitable law to regulate the practice of dentistry in the Philippine Islands. This matter had been taken up about the first of the year 1902 at the urgent request of several American dentists then practicing in the city of Manila, and was referred to a committee for investigation and report, but as no satisfactory report was ever received from the committee the matter was again taken up about the last of September 1902, which resulted in another investigating committee to which the Commissioner of Public Health was appointed as chairman. About the middle of October I was invited to meet the commissioner and the Secretary of the Interior for the Philippine Islands, for the purpose of consultation in regard to this bill and was asked to formulate a draft of what I considered necessary for a proper law regulating the practice of dentistry in the Philippine Islands. After carefully reviewing the laws of the states of Minnesota, Alabama, New York, and Indiana, and the peculiar local conditions, I drafted a bill which it was thought would meet the conditions existing. This was presented to the committee and after a thorough discussion the matter was referred to the Commission for consideration. I was invited later to meet several members of the Commission in consultation, with the result that the present law regulating the practice of dentistry in the Philippine Islands was framed, and as Act No. 593 came up for public consideration in December 1902, and again in January 1903, being enacted with modifications January 10, 1903.

Several days after the passage of the act, I was again invited to consult with the Commissioner of Public Health in regard to the appointment and organization of a board as provided for in the act. As there were three separate and distinct classes of dentists then practicing in the islands—(1) Dental surgeons of the United States army then on duty in the Philippine Islands; (2) American dentists then engaged in civil practice in the Philippine Islands; (3) native dentists—it was decided that a representation from each of these three classes would constitute a very fair and equitable board. Several days afterward I had the honor to receive an official notification from the Civil Commission stating that I had been appointed a member of the Board of Dental Examiners for the Philippine Islands, and that if accepting the appointment I would report at the office of the Commissioner of Public Health for the purpose of meeting the other two appointees to the board and effect a permanent organization.

Up to the time of my resignation as president of the board, which was handed in the day I sailed from Manila, October 15, 1904, we had 45 registrants upon our records, of which number 20 were Americans, 18 Filipinos, 5 Spanish, 1 Hungarian-American, and 1 Englishman, with the following classification: Graduates with the degree of Doctor of Dental Surgery, 18, including ten army dental surgeons; Cirujano Ministrantes, 18; no degree, 7; Cirujano Dentistas, 1; Cirugia Menor, 1. Of this number one was a Spanish woman, a Cirujano Ministrante, and one a Filipino woman, a non-graduate.

There was also one Chinese dentist, named Chen Aun, who up to the time of my departure was not registered. The board was still contemplating plans by which he could be examined and the matter was under delayed consideration.

LEGISLATION.

It is believed that the time has arrived when provision should be made to reorganize the dental corps with commissioned status of three grades in the permanent establishment of the army. Such a reorganization could be effected with less than the present expense of the corps, which at the last appropriation figured $56,160 annually, and would result in untold benefits to the corps, as it would then be a means of attracting the very best professional talent from the better class of young practitioners. It would insure a future for its members by giving them rank and pay commensurate with the dignity of their profession and their status as professional men, and more nearly in proportion to the value of their service as specialists. It would be a stimulus for them to render their best service to the government, and would greatly assist in maintaining a high degree of efficiency and *esprit de corps,* would tend to elevate the official status, social standing, and self-respect of its members, give them a justifiable pride in the new specialty, and create a spirit of contentment and satisfaction in the individual membership of the corps, without which any organization has its limitations of efficiency. The corps has enjoyed the reputation of having a notable degree of professional talent. This is largely due to the established high standard for qualification demanded by the examining board, and also to the class of professional men who were originally admitted to the corps, all of whom joined with the expectation of finally becoming a part of the permanent establishment of the army, obtaining thereby an assured and honorable position during active life with ample provision for the future.

The majority of dental surgeons who have been on duty in the division of the Philippines are beginning to manifest a spirit of unrest and discontent at the present contract status. If this is not changed it will result in the corps losing a large number of those desirable young men of highest qualifications who cannot afford to remain stationary in a position which does not hold other inducements for the future than a continuation of this status of inferiority. The results will then be that the only class of men who will be attracted by a contract status will be those of roving disposition who may care to see some of the world in traveling to and from our insular possessions—men who have no intention of staying in the service more than a year or two, with no inclination to make a study of military dental surgery for the betterment of the new specialty, or with any ideas of familiarizing themselves with the customs of the service or its voluminous record and paper work. It, therefore, devolves upon this association, the natural mother of our Army Dental Corps, to take up the matter of legislation for the betterment of its offspring and the just military recognition of our beloved profession.

You must know, first, that the army is a very peculiar organization, differing from anything else in our American institutions except the navy, in that its very inception and maintenance depend upon class distinction among individuals otherwise free, equal, and independent Americans. This class distinction is based upon different gradations of individuals, termed "rank"—and without rank an individual in the army loses his personality entirely, for, generally speaking, the army is composed either of enlisted men without rank or commissioned officers with rank. Therefore the person or class of persons belonging to the army and supposed to be an officer but without either a commission or rank is an official hybrid and somewhat similar to a man that has fallen overboard in mid-ocean, who struggles hard to keep his head above water as long as possible, but eventually goes down in despair.

The present status of the Army Dental Corps is without commission, without rank, without military status, and almost without social recognition, except what through strenuous efforts the individual dental surgeon maintains for himself by continual struggle. If the best professional possibilities are expected of our corps and our greatest efficiency made available for the army along the line of tooth-conservation and the maintenance of a hygienic condition of the mouths and teeth of its *personnel,* then something must be done to place it permanently in the regular establishment of the army upon a commissioned basis, as *bona fide* officers; for at present we are neither officer nor enlisted man, and yet are bound by the inflexible rules of life and discipline demanded of *bona fide* officers. We are something like the old expression "neither fish, flesh, nor fowl," and the continued existence of our corps upon the same high plane as heretofore is sure to be of short duration.

The present status of the contract dental surgeon is continually a source of humiliation and degradation to all, and to those more sensitive men who have occupied social positions at their homes equal to the best in their several communities it is of course more keenly felt.

In the matter of uniform we are especially unfortunate—more so during the last two years than previously, on account of the fact that the present uniform prescribed for dental surgeons has no shoulder-strap with its indication of authority. We originally were permitted to wear the blue uniform with the shoulder-strap of a first lieutenant of the medical department, with the block letters "D. S." between the bars of the strap. Since this has been eliminated our blue uniforms are perfectly plain, with standing braid collar, having a silver caduceus and the block letters "D. S." thereon. To those unacquainted with the army there is nothing to indicate to what such an individual belongs—whether to some private corporation or whether he is only a liveried servant. The field uniform of olive drab is also without any indication of office, with the caduceus and letters "D. S." in bronze on the collar, and is the same on the cotton khaki used in the tropics. On the white uniforms the silver letters "D. S." and the caduceus adorn the collar, with no other marks. While wearing the service uniforms and cotton khaki with collar ornaments as described above, it is absolutely impossible to tell a dental surgeon from an enlisted man of the Hospital Corps at a distance of ten feet or more, as the enlisted men wear identically the same uniform (with the caduceus as a collar ornament), as dental surgeons—the only difference being that in place of the block letters "D. S." they wear the block letters "U. S." A distinction between these letters is impossible for the average person farther than ten to twelve feet. In fact, on several occasions in the office of chief surgeons of departments in the division of the Philippines, dental surgeons have been taken for Hospital Corps men and peremptorily ordered to report to hospital stewards for instructions, before the error was discovered. It seems a great injustice to educated professional men who have spent years in acquiring a technical and scientific knowledge of their specialty and who have qualified before a competent examining board before entering the service, to be so meanly uniformed as to be undistinguished from ordinary soldiers.

There is another thing in regard to lack of proper uniform that creates a hardship for the dental surgeon, and that is the discipline that must be exercised by him in the management of his particular line of business, for from time immemorial the enlisted *personnel* of armies have been taught to respect, obey, and look up to the wearers of shoulder-straps and to pay little or no attention to instructions or orders from other sources. Hence it often occurs that an enlisted man who perhaps may be the very pink of propriety in the presence of officers exhibits a tendency to question the instructions or orders given him by a dental surgeon, whom he regards as only a civilian anyway, with little or no authority to command him to do what perhaps may be objectionable to his tastes. Again, dental surgeons are not allowed to wear full-dress uniform. It was probably considered that they, being only temporary members of the army, would not care to spend the amount of money necessary to procure one of the elaborate gold-lace uniforms of this kind. What is the result? Simply this, that on many occasions all officers at the post where a dental surgeon may be serving are directed to wear full-dress uniform at some great function or ceremony. This, of course, deprives the dental surgeon from attending, and complicates matters, because on all occasions of this kind the officers on the post are *ordered* to appear; so he has either to stay at home and disobey orders or go without the dress uniform, still in disobedience of orders.

You may all say that there is no disgrace in the wearing of civilian clothing, as above stated, which is quite true; but at any army post where one is supposed to be an officer, or at least a quasi-officer, and is strenuously struggling to maintain even that status, I must say that to appear different from all the rest places a dental surgeon in a more or less humiliating position and indicates to him that he is one of the army only through sufferance.

Incidents of this character have not occurred in the Philippines for the reason that there the only full-dress uniform prescribed for all officers is the white one, which dental surgeons are allowed to wear.

The question of quarters at the various posts is another matter that brings up the objectionable features of this miserable contract status; for it makes no difference how old a dental surgeon may be either in years or in his profession, how able he may be in the performance of his specific duties, how high he may have stood or stands in his profession or socially, he is usually not allowed a choice in the selection of quarters until after everyone else of the commissioned *personnel* on the post has been satisfied; down to the youngest first lieutenant. This does not seem right or just, but it is one of the "ways of the army," and *is* right from their standpoint, as the dental surgeon has no rank, consequently no real official status. The same conditions prevail in the selection of staterooms aboard army transports.

What is urgently required is a permanent reorganization of the corps upon a graded commissioned basis, so that there may be some future held out to the successful and efficient dental surgeon—a future in which he may progress in rank through promotion; where he may be given the privilege of the longevity pay accruing from his length of service; where he may be allowed the accustomed ten per cent. foreign service pay equally with all other officers of the army; where there may be a certainty of continuous service while his health and efficiency hold good; where in case he is disqualified from further active practice on account of injuries or sickness contracted in the line of duty he may receive the proper and customary attention and in case of death his family may obtain suitable pension; where, after he has reached the age limit, fixed by law at sixty-four years, he may retire upon two-thirds of his pay for the work he has done and the services he has rendered to his country in the performance of his military professional duties; where he may enjoy the social distinction of a post without reserve and without feelings of humility, and can appear like the rest of the officers at the various functions formal and informal, and at various military ceremonies can feel and act as an officer and a gentleman.

The dignity of our profession demands that something be done for this corps, and that at this meeting we unite on some equitable and just measure for which all can work, putting forth their best efforts toward its early enactment before the corps loses any more of its more desirable men than the three who have recently resigned.

The discussion of Dr. Oliver's paper was postponed until the next general session.

Motion was made and carried to adjourn until 12 o'clock Wednesday morning.

WEDNESDAY—*Second Session.*

The second general session was called to order Wednesday morning at 12 o'clock, by the president, Dr. Boardman.

The minutes of the previous session were read and approved.

Dr. M. F. Finley, Washington, D. C., offered the following resolution:

> RESOLVED, That the Executive Committee be instructed to accept the credentials of all delegates coming to this meeting, and that the amendment adopted at the previous session only become operative at the close of this meeting.

The resolution was supported and carried.

Dr. Burkhart, chairman of the Executive Council, announced the program for the present session, which on motion was adopted.

The discussion of Dr. Oliver's paper was then taken up.

Discussion.

Dr. WM. CONRAD, St. Louis, Mo. I would like to ask Dr. Oliver if he found that erosion was more in evidence in the case of the officers than in the enlisted men.

Dr. OLIVER. That is a hard question to answer offhand. I would have to refer to my statistics before attempting to answer it. Unfortunately I haven't them with me, not expecting such a fine point would be brought up. My recollection is that there was no perceptible difference between the number of such cases in the Philippines and in this country, nor do I recall that any case of erosion could be said to have been caused wholly by service in the tropics. Of the number of these cases found in the mouths of officers and men, who at most are only transient dwellers in the tropics, there is little doubt that the great majority of them had existed for months, or perhaps years, prior to their term of service in the Philippines. I do believe, however, that there is reason to suspect that service in the tropics, with its debilitating effect upon the system, consequent disturbed nutritional functions, character of food, changed habits, etc., has a marked tendency to facilitate the development of this disease when once established.

Dr. CONRAD. I thought perhaps Dr. Oliver might have had an opportunity of discovering a difference. Almost every patient that comes to my office has more or less erosion. Without egotism, I would say that the class of people I work upon are subject to great social and nervous strain. The question was suggested to my mind by a report on the literature of erosion by a committee appointed by the Illinois State Dental Association. I understand this committee is still studying the question, but has not yet determined the cause of the malady. If it be due to the environment of those in a higher social position and be not manifest in the laboring class, it is a point well worthy of being studied.

Another point I wish to bring before this meeting, suggested by Dr. Oliver's paper, is the word "resorption." It means "reabsorption." My claim has been that it is only manifest in the case of the deciduous teeth, but Dr. Oliver claims that it is manifest in the case of the permanent teeth. I had a conversation with him on the subject, and I believe he has made a statement or suggestion in advance of the idea which I have maintained for many years—that resorption does occur in the permanent teeth; that means that something has been deposited and has been taken up by the circulation. The carious débris of broken-down teeth is carried into the saliva and lost by expectorating or swallowing. After all the teeth are extracted we have a constant loss of alveolar process until nothing remains but the jawbone itself. On this question up to last night I was not satisfied. I have maintained for many years that the resorption process only pertained to the deciduous teeth and the deciduous alveolar process.

Dr. J. Y. CRAWFORD, Nashville, Tenn. I think our profoundest thanks are certainly due to Dr. Oliver for the amount of labor he has performed in arranging this very satisfactory report upon what has been accomplished in practically four years in the military service of our country. During the mobilization of the United States government troops at the time of the Spanish-American war it was my privilege to visit the large military camp at Chickamauga, where at one time one hundred thousand soldiers were being prepared for active service. The Tennessee Dental Association held at about that time a meeting on Lookout Mountain, and we were invited to visit the military camp. In visiting the various commands and divisions, we were cordially received by the commander-in-chief and came in contact with a large New York regiment which had camped near a large spring which we had selected as the site upon which our luncheon was to be served. At about 12 o'clock, when the soldiers had finished their midday meal, some came with their tin buckets to get water, and one came along with his tooth-brush and sat down to clean his teeth. I called the attention of my companions and said, "He doesn't know how to clean his teeth." I said to him. "Young man, I am a dental surgeon, and

I see you cleaning your teeth, but I am sorry to tell you you have not cleaned them, as you have bread and meat in your teeth right now." I said, "Let me see." That crowd of boys gathered around, and it seemed to attract attention when I looked into the man's mouth. It was one continuous row of disease from one end of the line to the other. I assure you the condition of that regiment's mouths was enough to excite mutiny. Shame on the American people that they have not done better for the dental condition of their military service!

We have the worst teeth, almost, on the face of the earth. Climate, food, mixture of population, etc., has caused this condition of affairs. The statement has long ago been made and frequently repeated, and I turn it over and over again, and will do so until the obstinate American people understand the significance of a scholastic population of which ninety-five per cent. have decayed teeth. The man who will not uphold in the Congress of the United States any measure tending to ameliorate this condition of affairs, is not qualified to be a senator in the highest sense. Ninety-five per cent, of the children of this country have decayed teeth. Of all the diseases to which man is subject, whether it be inherited or acquired, no disease is so amenable to rational, intelligent treatment as dental caries. Of all the questions of public health, disease of the oral cavity demands more attention at the hands of the American people than any other question of public hygiene. This will certainly explain my enthusiasm.

Dr. M. F. FINLEY, Washington, D. C. At the outset it was very difficult to get Congress to realize that there was need for such dental service in our army, but the reports submitted to the War Department by the dental surgeons in the army have supported every contention we made in our efforts to establish this army contract dental corps, and in a personal conference with the Surgeon-general of the army I am pleased to say that he has frankly admitted that these reports tended to confirm all our representations in support of the actual demand for relief on the part of our army in the field and at the station.

Many years ago I had a conversation with the gentleman who is now Surgeon-general, and it was then difficult to get him to realize the importance of our end of the proposition. Fortunately at present we have his entire co-operation and support, and I happen to be on your Committee on Army and Navy Legislation which has been so ably upheld by this association, and the hope is well founded that within a reasonable time your committee will obtain results which will adequately maintain the men who go into this corps in positions of commissioned rank which will honor them and honor the profession.

Dr. JAMES McMANUS, Hartford, Conn. This is the first time I have realized the position a dental surgeon placed himself in, in accepting a position with the United States government. I was surprised to hear Dr. Oliver speak of the way they were set aside at all great functions; and in such a way that they could not in decency and with respect to themselves accept these invitations. He said that some of them asked leave of absence for a day or so to avoid attending certain functions, because they could not appear in uniform fitting the position which they occupied. We say today that the National Dental Association has done a great deal for the support of this committee. We have not done anything like what we should have done in the past and what we ought to do in the future! We should send this cry up from every state in the Union! Every state has two senators and a number of representatives. If each individual dentist will interest the different dentists in his state, and will personally write to each senator and representative and place this clearly before them, and demand what we have a right to demand, that the soldiers and sailors of our country shall be properly cared for by competent men properly ranked, much good could be accomplished; and I suggest that we hereafter do individually our duty. I took the liberty of writing to my own senator and representative.

Dr. A. W. Harlan, New York, N. Y. It appears to me from the many points considered in the paper of Dr. Oliver, that he presented in figures the most eloquent arguments of the value of this service to our soldiers. In the three years he was in the Philippine Islands, he tells me, 30,000 soldiers applied for relief, involving 76,000 cases—that is, more than one treatment in a single individual. In addition to the cases treated by the dental corps in the Philippine Islands, the service was also responsible for the promulgation of the Philippine dental law. The service was also successful in preventing the organization of a so-called dental college in the Philippine Islands because it was not properly equipped. In addition to that he stated something about the condition of the teeth of the natives and their food, habits, etc., that might bear some relation to certain diseases of the teeth and gums. Finally he presented in a very conclusive manner the status of the dental surgeon of the army, and the relation in which the members of the corps stand to the commissioned officers; also a recommendation that refers to the reorganization of the corps on a permanent basis—that is the most vital part of the paper—seeking for this purpose the indorsement and approval of the National Dental Association.

It seems to me that if we listened to that paper, evidently most carefully prepared and with most accurate statistics, we should go to the head of the corps with financial and political support for the reorganization on a basis that will place the members on an equal basis with every commissioned officer in the United States army, whether medical or in the line.

Dr. J. A. Libbey, Pittsburg, Pa. I am sorry I did not hear the paper, but from the discussion I want to make one remark here to impress every member of this association if they intend to assist the committee of which I am a member—and that is, that whatever work is done should be done through the National Dental Association and their committee. We can get what we want through the National Dental Association and their committee better than in any other way. We have had obstacles in the way of independent work. I hope there will be an effort made in this association to discourage any individual who would tend to disregard the committee. If the committee is upheld in its work we may accomplish the desired purpose. At the last session of Congress we were defeated by some work going on that was antagonizing our work. Let the work be done through the National Dental Association and through its committee. I hope this association will adopt a resolution supporting the committee, and requesting every member to constitute a committee of one to assist the work undertaken by the association through the Committee on Army and Navy Dental Legislation.

Dr. J. N. Crouse, Chicago, Ill. You do not want members to do individual work with their senators and representatives?

Dr. Libbey. Certainly we do, but to make their report to the committee, and not endeavor to get them to work outside the association.

Dr. McManus. I am not opposed in any way to the committee. I want every member to assist the committee in their personal efforts with the representatives and senators and to carry out the ideas and wishes of the committee.

Dr. Libbey. Nothing I said was in criticism of Dr. McManus, and I hope every member will do as good work as he can to assist our committee.

Dr. C. R. E. Koch, Chicago, Ill. I have felt very deeply interested in this subject ever since the instituting of dental surgeons in the army, and have felt much chagrined at the fact that dental practitioners receiving army appointments are considered as neither officers nor gentlemen. I hope that those of you who have ever served in the army or have had any experience in connection with it will understand the idea I wish to convey. I have great admiration for the men who are willing to devote their lives to the cause of Uncle Sam's soldiers, submitting to conditions that self-respecting men cannot help but feel the humiliating influence of. The position of the army dental surgeon is not defined officially as either officer, non-commissioned officer, or private, as he belongs to neither of these classes, nor does he belong to the line of the army; he is only a sort of adjunct to a very important staff corps in which he seems to have been put on endurance. In army social functions he does not rank as a gentleman. I think the time has come when all this should be changed. Even the uniform provided is so distinctive as to institute inquiry by its invidiousness.

I believe that the service of these men has been properly appreciated generally and that the experimental stage as to the value of the dental surgeon in the army is now over. I believe that the time has come for the government to establish a recognized dental department as an integral part of the army and navy of the United States, ranking as the peer of any other department and entitled to the same distinctions as the other departments.

I am fully conversant with the methods governing the departments in Washington. It will not only be necessary to enlist the support and co-operation of the members of the House and of the Senate, but it will primarily be necessary to enlist the sympathy of the heads of the medical departments of the army and of the navy. These gentlemen are constantly on the ground, and their influence with the members of Congress is not to be lightly regarded, therefore I would suggest that the committee which may have this matter in charge do not ignore the Surgeon-general's offices in Washington, but on the contrary secure their co-operation.

I personally obligate myself to do everything that one individual can do to further this movement, and to endeavor to enlist a number of the congressional delegates from Illinois in its support.

Dr. WILLIAMS DONNALLY, Washington, D. C. I should like the opportunity, since the objects committed to the Committee on Army and Navy Dental Legislation have been debated, to say a word. I have been a member of this committee for seven years; have handled all the correspondence, have drawn all the bills presented to Congress; also presented the profession's claims for commissioned rank to the War and Navy departments and to the committees of Congress, and have endeavored to keep the profession well informed in regard to the methods of promoting the profession's interest in the premises. The committee has had the hearty and continuous support of the officers and Executive Council of this association, of a large number of influential and earnest individual members of the profession, and also of university presidents and dental college faculties. Only a few, perhaps not more than a half-dozen in the dental profession, have antagonized or interfered with the attainment of this object of the profession. The attainment of the object involves a judicious conception of the most intricate and delicate problems and demands a perfect concurrence on the part of all concerned.

The Surgeon-general of the army has advised interested persons who called on him that all should work together with the National Dental Association Committee to gain anything at all. How can we hope to gain even the simple and modest provisions of the army dental bill reluctantly consented to by the Surgeon-general and reported against by the general staff, by the present and also by the former Secretary of War, while there is discord in our ranks, in the face of the fact that the army medical bill failed of passage notwithstanding that it was supported by the American Medical Association; by the representatives of each state medical association, and directly by more than 2300 county medical societies; by the Surgeon-general, by the general staff, by Secretary Taft and ex-Secretary Root, by the Senate and House Committee on Military Affairs, and by President Roosevelt in a special message to Congress? How many of you realize or even attempt to weigh the difficulties and obstacles to be overcome by our profession under the leadership of your committee? How many realize the significance of what has been accomplished in spite of powerful opposition, by the terms and present status of the army and navy dental bills? Remember that the War and Navy departments never supported the proposed dental legislation, nor has the dental profession done so with anything like the unanimity and zeal with which the medical organizations support pending medical bills.

Your committee has been for seven years your servant, doing your will at a sacrifice and with no hope of reward in this world. If it faithfully represents you, support its efforts; if it does not, discharge it and lift the burden. Any interference with the plans of the authorized committee, or any individual effort inconsistent with these plans, may defeat the object, as interference and effort has already retarded and made more difficult the attainment of the object. No one on the committee has any personal interest whatever in the result, nor has the committee at any time consented to terms less favorable than are possible of attainment through realizing the force of the warning of War department officials that the more we ask the less likely we are to get anything at all. If this meeting had given half as much time and attention to the legislative problems confronting your committee that you have to incidental aspects of the subject presented in the paper and in the discussion, you would be better prepared to form a correct judgment as to what should be the proper attitude of the profession in the premises.

Dr. Oliver (closing the discussion). I am much pleased to hear so liberal and spirited a discussion of the paper. It shows you are interested in this important work of our corps and keenly appreciate the fact that some plan must be formulated to provide for its assured permanence. It is hoped that the several factions of the corps' friends, who have at different times sought favorable legislation for it, will be able to get together and agree upon some one scheme for its reorganization that will meet with the approval of all who are interested in the matter. Then a united effort may be made toward its early enactment.

We do not aspire to high-sounding titles or rank, but we do believe the time has arrived when as representatives of a noble and scientific profession of universal recognition, we should have a just and permanent military recognition in the regular establishment of the army, with rank sufficient to sustain the dignity of professional men, and pay enough to properly maintain that position. A reorganization should contemplate at least three grades, so that some future may be held out to the successful and worthy men of the corps, with something to strive for as the occasional opportunities for promotion occur.

It should provide for continuous service while health and efficiency hold good; proper disposition of those injured or disqualified by sickness contracted in the line of duty; suitable officer's pension for the family in case of death while in service; longevity pay accruing from length of service; a ten per cent. increase of pay for foreign service as all other officers are allowed, and privilege of retiring at sixty-four years of age with three-fourths pay for the good that has been done in the country's service.

This will give more of an equality status to the dental surgeon, and will be highly beneficial in many ways, for then he could enjoy the social functions of the military post without reserve or humiliation, and could appear on all formal occasions feeling and acting as an officer and a gentleman. Such a reorganization could be maintained by the government for over four thousand dollars less money annually than the present organization costs, and would undoubtedly give far greater satisfaction to all concerned.

I have here several articles that may interest some of you, viz, statistics of the Philippine Board of Dental Examiners; snap-shot pictures of army dental offices in the field and elsewhere in the Philippine Islands [see pp. 213 ff.], records of cases presented and operations performed [page 218], and other things that any of you are welcome to inspect.

I thank you for the courtesies extended me.

On motion the subject was passed.

Dr. Eugene H. Smith, Boston, Mass., read a report of the Committee on Journal, which was ordered referred to the Executive Council.

Dr. R. H. HOFHEINZ, Rochester, N. Y., then read a paper entitled "The D.D.S. Abroad," as follows:

THE D.D.S. ABROAD.

If time permitted I would gladly give a bit of history of the D.D.S. abroad. I am limited, however, and must therefore condense my article into the most essential facts, together with the appeal which comes to us from the D.D.S. of Germany at the present time. The Americans have always expressed pride in their foresight, in their sharpness, in their ability to anticipate desirable results. This, however, is scarcely a national trait, as others must be given credit for the same qualifications. When the English dental profession applied to Parliament for a dental law that would weed out the foreign practitioners, they discriminated against all American schools except Harvard and Michigan. Had they included these two schools with the others, the act would have become prohibitive, and the English dental mind would have experienced certain defeat.

For the time being Harvard and Michigan were excepted, which was a shrewd move on the part of those applying for the act. It appeared like acute discrimination between good and bad schools, and this appealed to the sense of fair play, a thing that appeals to all Englishmen. This act, however, was nothing more or less than an entering wedge for that subsequent legislation which wiped both Harvard and Michigan from the list of recognized schools.

Germany is ready to do the same thing, with the exception that it recognizes Michigan only as a state university, classifying all others as "private institutions." Recent action taken by the German authorities has awakened feelings of the gravest apprehension on the part of the American dental graduates practicing there. Decision after decision has been handed down by the several German courts, each giving to the ever-ready German dentist new weapons with which to prosecute his American competitor. The German Society of Doctors of Dental Surgery, with the able and untiring assistance of Consul-general Dr. Worman of Munich has been doing all in its power to repulse the repeated attacks made upon its members.

The German-American Dental College of Chicago, and allied swindle institutions, have so prejudiced the German government officials that through the latest supreme court decisions they have not only refused to recognize the American graduate as the equal of the German Zahnarzt, but have classified all D.D.S.'s in Germany with the non-graduates or Zahnkünstler, a class notorious for their lack of theoretical preparation for the profession, and of whom no dental education is required by law. Neither is the D.D.S. granted the lawful protection due to every German graduate against accidents happening to patients in the practice of the profession, which alone may lead at any time to the ruin of any of the practitioners. Within a short time the use of any medicaments will be forbidden the D.D.S., a measure which will compel the American dentist to close his office.

The most important adverse decisions are based upon the supposition that the American dental colleges are private institutions and unlike the German universities of like character, which are state institutions—are not of the same standard and their diplomas do not possess the intrinsic value of those granted by state universities. It is difficult to convince a foreign nation that so many schools are uniform in their requirements and points of excellence as are ours. It is well known to us that certain dental schools of the state of Illinois, the statutes of which permit the incorporation of degree-granting institutions which have practically no responsibility whatever, have sold diplomas to students all over the world. We have made every possible effort to annul the existence of such shameful spots upon our escutcheon, and it remains for this society, together with the National Association of Dental Faculties, to do something energetic and definite for the D.D.S. abroad, in the matter of compelling recognition of the diplomas of our reputable and recognized schools.

I have in my possession papers which show in detail the enormous amount of annoyance that the D.D.S.'s of Germany are subjected to, and also the great amount of fruitless labor they have undertaken in endeavoring to establish their good right. I quote only from the letter of a D.D.S. of international reputation: "I have been called to the police station three times lately for exhibiting my D.D.S. on my card, the telephone book, and in my hall, though on my sign in the street I have nothing but Boedecker. One of the Berlin dental societies has made it its business to annoy American dentists, individually, as soon as they see a D.D.S. anywhere, and such complaint need not be accompanied by the name of the accuser." This distinguished gentleman has since discontinued his practice in favor of his son, an American D.D.S. and German Zahnarzt.

The remarkable paradox remains that the law-makers and the heads of the different governments have their valuable dental organs taken care of by the D.D.S. Members of the Kaiser's family entrust the care of their teeth to a D.D.S. well known to me. One of our friends practicing in England failed to get on the register. Though he was willing to make reasonable concessions to go before the board, their conditions were such that he could not do so and still retain his self-respect. The president of the board of examiners and his *confrères* officially ostracised the D.D.S., but this same president thinks it necessary and makes it convenient to travel forty miles to meet an appointment and to be served dentally by this same practitioner. Gentlemen, have we no power at command to compel the recognition of a degree which has been a synonym for excellence for the last fifty years? It seems hard, unjust, almost laughable, to have a degree null and void which has been signed by men whom the dental world has recognized as the worthiest and foremost members in the profession.

It is useless for me at this time to point out the superior qualities of most of our American dental schools over those abroad. Everything done on the other side of the Atlantic is more or less a clever imitation of our own schools. Whether the fact that all universities abroad are under state supervision compensates for other existing deficiencies is not under discussion. The fact remains that the European countries which have not yet stamped the D.D.S. degree with the seal of death are making the fight on this specific question.

Drs. Van Beust and Milke of Dresden, and others representing the Society of the American D.D.S. abroad, have requested to have us send them the following documents authorized by the N. A. D. F. and the N. D. A.: (1) A certificate expounding as clearly as possible in what respects the American dental college is a lawful corporation; its relation to state boards or to a state superintendent of public instruction, if such exist, and showing in what respects it may be considered a state or public institution. (2) A certificate setting forth the requirements for matriculation; the number and character of the obligatory branches of study; the requirements for attendance of lectures, the methods used in examining and the thoroughness of the examination of each candidate for graduation of every college belonging to the N. A. D. F. (3) A certificate stating in what respects the N. A. D. F. is a legal corporation; its function, its code of rules, and the relations of this body to each college. (4) A certificate clearly proving the legal value of a diploma from any of these colleges and showing what rights are granted thereby. (5) A complete list of the reputable dental colleges of the United States. Also answers to the following questions: (1) Does the degree of Doctor of Dental Surgery, irrespective of all other rights it may confer, privilege any graduate without additional preliminaries, to *merely call himself* "Doctor of Dental Surgery" in any state of the United States? (2) Is the graduate of dental surgery qualified by law as a medical person? May he without first consulting a doctor of medicine operate, administer medicines internally, and produce general anesthesia? It would be of value to have the two last-mentioned documents signed by the governor of a state; if this be not possible, then by the state boards of dental examiners.

I will present a relevant resolution after the discussion of my paper.

We are living in the age of arbitration. The Russo-Japanese war may be the last great war the youngest of our generation will have witnessed. We are drifting toward an educational *entente,* and, paradoxical as it may seem, it is Germany, which today is fighting our D.D.S. degree, that has principally taken the initiative in this educational interchange.

The Faculty of Philosophy of the University of Berlin announced officially that graduate work done in any of the fifteen institutions comprised within the Association of American Universities shall henceforth be accepted as equivalent to work achieved by resident students at a German university, the only restriction made upon the candidate for the degree of Doctor of Philosophy being that at least three semesters shall be spent in actual residence at a German university; the remainder of three years, or six semesters, however, may be taken in one or more of the American universities specified.

This action, it need scarcely be pointed out, is not only a singularly definite recognition from a conservative source of the worth of graduate instruction in our universities, but it is also important for its bearing on the higher education in both countries. A concomitant action of the Berlin faculty is that the bachelor degree of any American institution will hereafter be accepted at matriculation as equivalent to the *testimonium maturitatis* of the gymnasium, the preparatory school for the university.

The German emperor has recently suggested a system of interchange between the members of the German and American universities, a most significant step toward educational reciprocity. The dictatorship in education has long and rightly been assumed by Germany, but it is making way for a broader and more liberal construction of the purposes of education.

Though we gladly grant the European nations superiority in most of the educational matters, I assert, and with me all of you agree, that dental education has been far superior in this country ever since dentistry embarked upon its present scientific independence. We have a moral and scientific right to claim the first position among the nations of the world, though we may not be free from blemish.

It is our duty to see that a title which has made American dentistry known all over the world is not exterminated in the countries which are but imitators of our dental achievements. If such rights cannot be attained in a proper spirit of educational reciprocity, I believe that even diplomatic help should be appealed to.

Our refreshing diplomacy has to its credit so many great achievements that it should be an easy matter to regulate this question. A new system of international educational interchange will, when properly adjusted, not only add in its way a new element of value to academic education, both here and abroad, but will inevitably prove a long step toward that unification of the highest education which, however different its details might be, should make it essentially the same in spirit and effect in all the progressive nations.

Discussion.

Dr. James Truman, Philadelphia, Pa. It is a matter of regret with me that I feel obliged to antagonize some of the sentiments expressed in this valuable paper of Dr. Hofheinz. In this country some have been working for years for similar laws, and now they are coming back as a boomerang and are proving an injury to our graduates. It is nothing new for the Germans to prohibit the use of the D.D.S. degree, for it is as old in my experience as 1877. Indeed, that prohibitive action of the German law is necessary for the government of the profession in that country, and I am in sympathy, I must confess, with that attitude to a large degree. It is a well-known fact that American dentists have been invading the European countries—not only American citizens, but Germans who come here to graduate and then return to their own country to practice.

It is perfectly natural that individuals over there should be in opposition to them, and the influence of that paternal feeling that is always present in continental countries leads them to go to their government, and the German government says, "No one shall practice dentistry unless he has our degree;" and therefore the D.D.S. degree is not recognized. I was brought before the police court of Hanover while practicing dentistry when a resident there because I made use of the D.D.S., and, absurd and paradoxical as it may appear, at the same time the police president said, "If I want to have any dentistry done I will come to you, but if you want to practice under the D.D.S. I will have to arrest you." At the same time I had the Hanoverian court in my *clientèle.*

Let us take the moat and beam out of our own eye before we bother about that in our brother's eye. We have laws here. I cannot go into New Jersey today and practice, for as soon as I should open an office some man would come and say, "You have not registered in New Jersey." The German is simply doing the same thing. It is not fair for this organization to go before the world and ask the Germans to give up their protection of the degree of Zahnarzt. Let us look after our own country, and allow a man who has legal qualifications in one state to go into another if he should so desire and practice. Then we could go into foreign countries with clean hands and demonstrate consistent methods. You do not do this, however, and you do not intend to do it, and therefore it is impossible to grant them reciprocity; consequently all the efforts made will be futile.

Germany has accepted Michigan University because it is a state institution. All the rest of our institutions are supposed to be private. Can we blame Germany? We have high universities here, but they are not all state institutions. The German loves law; he loves the protection of the government; he wants the great seal of the government on every diploma that he is asked to accept, and unless it has the power of the state behind it he will not be willing to recognize it. Thus there never will be reciprocal action between foreign countries and our own until all our educational institutions are based upon something like the order of the German schools. I have a high regard for the German method of education, and hold it far superior to the education of this country, because it is based on a system. There is no system here in our educational and dental institutions, and this leads to antagonism one with the other. Let us go before the world, I repeat, with clean hands, and not depend altogether upon law for the maintenance of our profession.

Dr. E. C. Kirk, Philadelphia, Pa. In studying this matter, as I have done for the past several years, a growing conviction has developed in my mind that there is no political question—using that term in a broad sense—which concerns the dental profession more closely than the one under consideration. The matter of the present relations between Germany and America in regard to the recognition of the dental degree is simply a practical expression of the professional attitude of mind in both countries. The question is a complex one. It is complicated by many factors, and by one in particular that will have to be looked into carefully in order that we may reach that condition stated by our good friend Dr. Truman. We should go before these governments with clean hands and then make our demands. But before we can reach that point there are a number of things to be done.

The whole dental world is familiar with the tremendous work begun and carried out by Dr. W. C. Barrett of this city. We know the causes which brought about this activity. The impression made by the work of Dr. Barrett has made itself felt in the minds of the German people. The question of the illicit diploma traffic is the club by means of which the German practitioner has been enabled to express his dislike for the American "Doctor" title. The state of Illinois, through conditions then existing there, made the traffic in illicit diplomas possible. The proof of the possibility is that it did exist—to the dishonor of the American title wherever it might be. As Dr. Truman has outlined, the American title has been a term to conjure with. The American dentist has practiced in Germany often to the disadvantage of the native practitioner. The public has somehow become educated in the belief that the American is the best practitioner. That view naturally aroused jealousy which could not fail to take advantage of the argument furnished by the bogus diploma mill and its illicit degrees and cause it to be said, "They are all alike; we will make no distinction—we will throw the whole lot into disrepute."

I am not in position to tell all that I would like to say at this time about the status of the effort which is being made to straighten this matter out. I will say, however, that I am not quite so disheartened with regard to the outlook as Dr. Truman seems to be; I am rather more optimistic in regard to it. I believe we have almost reached the "psychological moment," the time to strike, and I further believe that the avenue through which the equitable adjustment of this difficulty is to be wrought out must be through diplomatic representations between Washington and Berlin. The state has taken up the matter. We have the assurance that they are taking up the matter sympathetically; I know in detail what has been done, and I think the outlook is hopeful for a better understanding of this question being arrived at as between the governments of the United States and Germany.

The United States government has given a quasi-recognition to the D.D.S. degree, by incorporating a recognition of it in the dental law of the Philippine Islands, and it is in a position to recommend to the German government a list of reputable institutions whose degrees may be accepted. Our government is interested in this matter, and the German government is sympathetically inclined to give it a hearing, and the principal parties involved are in a position to do something. I do not feel at liberty at the present moment to say any more than that the outlook is encouraging.

I regret exceedingly that Consul-general Worman is not here to speak on this matter, but he will be present tomorrow and will make a report to the National Association of Dental Faculties when that body convenes. I do not know the nature of the recommendation Dr. Hofheinz will make, but I hope it will take such a practical form that this body may commend it to a certain number of their members for consideration with power to act in co-operation with the Faculties Association to further this work, which can be referred back to the main body for resolution so that concerted action may be taken, and thus remove this blot from our escutcheon and that we may go with clean hands to ask what we desire.

Dr. C. R. E. Koch, Chicago, Ill. I am exceedingly interested in this paper and the discussion that has followed. I confess that I am more in sympathy with Dr. Kirk than with Dr. Truman; I feel very optimistic. Under the constitution of the state of Illinois, unfortunately, a charter can be obtained for any reputable purpose upon the payment of the fees and compliance with the regulations for issuing the same. The butcher, the baker, and the candlestick-maker can, if they so desire, organize a dental college. This has given the opportunity for the establishment of several so-called dental colleges in Illinois in the past which brought disrepute not only upon our state, but upon the entire country.

The dental law of Illinois which has been in operation since 1881 compelled the Illinois State Board of Dental Examiners to issue a license to all graduates from reputable schools without examination. This constituted the said board, by inference, the judges of the reputability of schools. For more than twenty years the board fought bravely to keep down and withhold its recognition of diplomas issued by bogus or inefficient schools, and made an herculean fight against the traffic in diplomas. There was a period of a few years during which the board was less watchful and less conscientious in the discharge of its duties in this respect, but for more than five years the dental officers of our state have again labored vigorously for the attainment of the highest position possible in the dental schools, not only of our state, but of all the others. The courts of Illinois have sustained them in this endeavor, and have by decisions from the bench assisted in removing the blot from the escutcheon of Illinois and its dental profession and educational institutions.

And now Illinois comes to you with her newly enacted law of this year, which empowers its board of dental examiners to make reasonable rules to establish a standard for dental schools or colleges which these must live up to in order to be considered as reputable and in order to have their diplomas recognized as a basis for admission of the holder to the examinations for practice in the state of Illinois. The power of dental colleges anywhere to confer vested rights to practice dentistry in the state of Illinois has been taken away. Hereafter anyone desiring to be permitted to practice in our state must present himself for examination before the board, and in order to do this must possess either a diploma from a reputable dental or medical school or college, and pass a satisfactory examination in dentistry. Or if he has been in lawful practice for five years immediately preceding his admission to practice in Illinois or in any other state of the Union or foreign country, he can also be admitted to the examination of our board. The state of Illinois now, as well as most of the other states, confers the right to practice under license; the schools simply prepare the candidates for these examinations. I believe that this is the entering wedge toward the attainment of reciprocity between the states, and when we shall have accomplished this end ourselves, and it will not be many years—Dr. Truman will be here to see it—then we shall be able to say to the rest of the world, "We tender reciprocity to you."

Let us be fair to Germany. Their ideas and ours are entirely dissimilar with reference to practicing a profession and using the title of doctor. We here in America believe that it is necessary to restrain one from performing certain functions unless he has given to the people's representatives—the dental examining board—evidence of his fitness to do so. We are not much concerned about whether he calls himself "Dr.," "Professor" or "Mr." In Germany the title is the important thing; they do not seem to care so much as to what one undertakes to do, so long as he does not employ or use the title of doctor. Titles are conferred there by the government, and it is not easy to reconcile Germans to the validity of titles fairly earned by their possessors and conscientiously bestowed by recognized institutions of learning. I realize now the difficulty our German *confrères* are laboring under, but I believe that relief can be given them, and that the German government may be induced in time to change its attitude toward American dental institutions. From information which I have privately obtained, I have learned through a source that cannot be questioned that no dental school of the United States is recognized there at the present time. They do not understand that here each state is overseeing and controlling dental education, just as obtains in Germany. Because we have not a centralized form of government but leave this matter to be adjusted in each state according to its particular laws, they have formed the belief that government supervision does not exist.

It is my belief that a committee should be appointed from this body and from the National Association of Dental Faculties, which should invite the German government and the Germans to thoroughly investigate our educational institutions and the laws of our states supervising their work. Let them turn the Roentgen rays on our institutions and let them ascertain whether they are worthy of recognition. I have no fear of their verdict and believe that international reciprocity would follow. We cannot hope or expect immediate results, but must abide our time.

Let us work together for this country first. The dawn of reciprocity among states on the American continent has already appeared. Michigan, New Jersey, and the Northwest Territory of Canada have established mutual recognition of their boards' work. This is the entering wedge, and when the few remaining states shall have passed laws similar to those of the great majority of them, requiring examinations from all candidates for admission to practice in the several states, based upon the possession of a diploma from a reputable school, I believe that reciprocity will follow between the state boards discharging their duties on the same lines. When all boards shall have the same standard for the schools and conduct their examinations on the same lines and exact the same requirements from candidates, the verdict will be alike. In each state the board will be willing to recognize the work of another board just the same as now the faculties of the different schools recognize and give credit to students for work done in any other school.

The time is coming, and I expect to be here long enough to see it, when this recognition will be universal among our state boards.

Dr. J. N. Crouse, Chicago, Ill. The state of Illinois of course is in disgrace on account of the appointment of a bogus examination board a number of years ago. I was made chairman of the prosecuting committee of this association, the National Association of Dental Faculties, and the State Board of Illinois. In that matter I went as far as the funds went, and I began to figure up I was seven hundred dollars out, when I thought it time to take a rest and see where the funds were coming from. The work is not complete, but it should have been completed before this time; it is possibly my fault. I have not made a report, and I want an opportunity to make it at the proper time here. The state of Illinois has appropriated $3200 toward the prosecution; the National Association of Dental Faculties has appropriated $1200, and this association $1000. These are the funds which have been put into my hands up to this time. We have many indictments on this score to pass in Chicago, and for good legal reasons I have let them hold over, and the parties are under bond. Last Tuesday I received word by accident that someone was doing something in the Smeizer case, and I sent Dr. Reid over to the state attorney's office and learned that the case was up for reconsideration, but that it would be dismissed, at the September term of court. We have put the German-American College out of business long ago. I have talked to the president of the Federation, and some action ought to be taken on this question. It really should have been taken a year and a half ago.

In regard to reciprocity, a decision of the supreme court recently is to the effect that one cannot deprive a man of his means of livelihood no matter if he has a diploma or not, provided he is qualified to carry on his work. The amendment should be that the state boards have the police power to say who shall practice, no matter where the professional education was obtained. Then they will examine the product of the schools and not the diplomas. If they are fitted, give them the authority to practice. I know I am correct in my authority. I want to make a report as the prosecution committee and give my financial statement.

Dr. H. J. Burkhart, Batavia, N. Y. I think in the discussion of the paper one material point is being lost sight of. When the question is taken up through diplomatic channels, the first question the German government will ask is, "Will you give us equal privileges in your country?" As you well know, our state laws are not in harmony with regard to granting licenses to practice, while on the other hand the German government has a general law for all of her provinces. In my judgment, the only thing which is likely to be accomplished will be some arrangement with the German government whereby those who were in practice prior to the time that they were placed under the ban may have the privilege restored to them. I do not believe that it will be possible to obtain the right for our graduates to practice without restriction until we are willing to grant the same privileges throughout this country.

A great deal has been said about enacting a general statute by Congress governing the practice of medicine and dentistry. I do not believe that this can be brought about for a great many years, on account of the peculiar relationship of the states to the general government and the reluctance on the part of those in national authority to interfere with the police power of the states in matters affecting the public health. I should be very glad to have a committee appointed to take up the matter through diplomatic channels, and if possible endeavor to arrive at some temporary understanding at least with England and Germany, so that those who are now in practice in those countries may have an opportunity to continue their work undisturbed.

Dr. HOFHEINZ (closing the discussion). If, as Dr. Truman thinks, the question has existed since 1877, it has only been in a modified way, because men like Evans, Abbott, Jenkins, and many others have practiced unmolested up to this date. But Dr. Boedecker and others who have an international reputation are molested every day, and in a very unpleasant manner, and it is for this reason that I have requested you to do something definite, and I beg to offer the following resolution:

RESOLVED, That the chair appoint a committee of five, with full power to act, with reference to the suggestion contained in the paper; the committee to consist of one member of the Foreign Relations Committee of the National Association of Dental Faculties, one of the National Association of Dental Examiners, and three of the National Dental Association.

The resolution was supported and carried.

The chair appointed as such committee Drs. R. H. Hofheinz, E. C. Kirk, C. C. Chittenden, H. J. Burkhart, and Eugene H. Smith.

Dr. H. J. BURKHART then offered the following resolution:

RESOLVED, That it is the sense of the National Dental Association that all matters connected with the army and navy shall be transacted through the duly accredited committee of this association.

The resolution was supported and carried.

After announcement of the proposed programs for the various sections, the meeting adjourned until Thursday morning at 12 o'clock.

THURSDAY—*Third Session.*

The third general session was called to order by the president, Dr. W. E. Boardman, at 12.30 o'clock, Thursday, July 27th.

The report of the Executive Council was read by Dr. Burkhart, chairman, and on motion adopted.

The next order of business was the election of officers, and the President appointed as tellers Dr. C. S. Butler, C. W. Rodgers, and J. A. Libbey.

Dr. A. W. Harlan proposed that the city of Atlanta, Ga., be chosen as the next place of meeting, and the time the first Tuesday in April.

The Secretary then read a telegram from Dr. J. A. Gorman of Asheville, N. C., inviting the association to convene there for its next meeting.

Dr. J. P. Gray proposed Lookout Mountain as the next place of meeting.

The question of the meeting-place was discussed by Drs. J. D. Patterson, J. N. Crouse, T. P. Hinman, Geo. L. Field, and J. Y. Crawford, the last-named seconding the nomination of Atlanta, and offering an amendment that the meeting be held there on the third Tuesday in September.

The resolution was supported and carried.

ELECTION OF OFFICERS.

The election of officers was then proceeded with, and resulted as follows:

President—M. F. Finley, Washington, D. C.

Vice-president for the South—Frank Holland, Atlanta, Ga.

Vice-president for the West—Wm. Conrad, St. Louis, Mo.

Vice-president for the East—L. P. Bethel, Columbus, Ohio.

Corresponding Secretary—C. S. Butler, Buffalo, N. Y.

Recording Secretary—A. H. Peck, Chicago, Ill.

Treasurer—V. E. Turner, Raleigh, N. C.

Executive Council—H. J. Burkhart, Batavia, N. Y.; Charles McManus, Hartford, Conn.; J. Y. Crawford, Nashville, Tenn.; F. O. Hetrick, Ottawa, Kans.; E. K. Blair, Waverly, Ill.

Executive Committee (three members)—J. D. Patterson, Kansas City, Mo.; H. B. McFadden, Philadelphia, Pa.; C. J. Grieves, Baltimore, Md.

On motion the Executive Council was empowered to select officers for the sections, appoint the various committeemen, etc.

Dr. EUGENE H. SMITH, chairman of the Committee on the President's Address, reported as follows:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

July 26, 1905.

Your committee appointed by the chair to consider and report on the recommendations contained in the Address of the President beg leave to present the following report:

The president recommends the elimination of what he terms the absurd clause from the constitution which provides membership to those only who have received a degree from a dental or medical college since 1875. In view of the present increased facilities for acquiring a dental or medical degree, your committee do not indorse that recommendation.

The president recommends that the association be made a representative body, similar to the body known as the British Dental Association. The president points out that any reputable practitioner registered in Great Britain may become a member upon the recommendation of three members, one of whom shall know the applicant personally. Your committee indorses this recommendation with the provision that all applicants for membership in the National Association shall possess a medical or dental degree.

In an elaborate discussion of the present method of conducting the meetings by sections, the president recommends that section work be done away with, and that the papers now presented in the different sections be properly arranged by a committee and brought before the general assembly. Your committee have been given to understand that the section system worked badly at previous meetings, but the observation of your committee of the section work at this meeting leads them to believe that if properly conducted it may be a success. Your committee, therefore, do not feel like recommending that the section system be abolished.

The president presents the matter of the publication of the association's proceedings in a journal controlled by the association, and suggests for this purpose that a plan be devised whereby the association acquire the ownership of the *International Dental Journal*. Your committee are in accord with this suggestion, and recommend that the association own and control a journal of its own, and that a committee of three be appointed to devise ways and means to this end.

In regard to the recommendation of the president as to the establishment of a fund for the provision of aged and infirm members, your committee would recommend that a committee of three be appointed to look into the matter, and report at the next annual session of the association.

The president touches upon dental service in the army and navy, and recommends that each member of the association personally communicate with every representative and senator of his state, and induce others to the same effort, so that our representatives in Congress may be promptly appealed to to vote for the bill. Your committee being conversant with what has already been done in the way of an army and navy bill, and realizing the confusion that might come to the cause by indorsing this recommendation of the president, advise that all members communicate with the members of the committee of the association having this matter in charge, and act only under its advice.

The president discusses the matter of reciprocity, or interstate dental licenses, and suggests that the matter be brought in some manner before this association for action or recommendation. Your committee being mindful of the fact that the National Board of Dental Examiners is now strenuously striving to bring about this desired result, would recommend that no action be taken at this meeting.

In the president's discussion of the two dental degrees, he calls attention to past and present criticism in regard to this condition of things, and suggests that this association take up the matter of degrees and recommend the adoption of one degree in all the dental institutions of this country. Your committee fully realize the desirability of such a condition, and would respectfully recommend that a committee of three be appointed from this association to present the matter to the National Association of Dental Faculties.

Respectfully submitted.
(Signed) EUGENE H. SMITH,
WILLIAM H. POTTER,
CHARLES McMANUS,
Committee.

Dr. J. N. Crouse offered as an amendment that the proposed Committee on Journal be increased to five. The amendment was accepted.

Dr. H. L. Wheeler offered a resolution that the report be adopted, with the amendment as offered; that a committee of five be appointed by the chair to consider the matter of ways and means to bring this about, and if necessary with power to act.

The motion was seconded by Dr. J. N. Crouse and carried.

On motion the session adjourned to meet at 8 o'clock P.M.

THURSDAY—*Evening Session.*

The session was called to order by the president, Dr. Boardman, at 8.30 o'clock.

The chair appointed as a committee of five to devise ways and means to acquire ownership and control of a journal the following: Chas. O. Kimball of New York; Wm. H. Potter, Boston; H. L. Wheeler, New York; L. G. Noel, Nashville; B. Holly Smith, Baltimore.

In connection with the Fourth International Dental Congress, Dr. H. J. Burkhart stated that there were sufficient funds in the treasury to defray all necessary expenses, and that the committee of organization had today returned to the treasury of the National Dental Association the five hundred dollars which was advanced by the association last year. The treasurer had also been instructed to pay to the Southern Branch of the National Dental Association the three hundred and fifty dollars which it had advanced.

A paper was then read by Dr. S. H. GUILFORD, Philadelphia, Pa., on "The Nomenclature of Orthodontia."

[This paper is printed in full at page 135 of the present issue of the COSMOS.]

Discussion.

Dr. JAMES McMANUS, Hartford, Conn. It has been my experience in the past to listen to very good articles on this subject, among them one read by my good friend Dr. Palmer several years ago. Dr. Atkinson also was constantly speaking on this subject. Different professors and practitioners at various times have told us what we should do in relation to it, and still we have been going along at the same rate, using the same old terms, and the present generation is likely to continue to do so. At a meeting in New York last winter, largely attended, two gentlemen used terms that much to my surprise, were treated by many of those discussing the papers as if they were unacquainted with the meaning. Both were accomplished dentists and members of colleges with a strong and well-deserved reputation. The papers read before that and other associations will not change the habits of many of the older men of the present day. I wish to offer the suggestion that we appoint a special committee from the National Association of Dental Faculties. It seems to me one of the best things that could be done would be to select from among their members a committee that would thoroughly study this subject from its professional aspect, so as to formulate a standard of nomenclature that every dental teacher in these colleges would live up to, and then the future dentists coming into the field would have a nomenclature that each could understand. Our nomenclature can never be changed unless there is a definite understanding among the faculties of the different colleges in the matter.

Dr. C. S. BUTLER, Buffalo, N. Y. I believe there is scarcely a subject that can come before us as a profession which is of greater fundamental importance than that which relates to the formation of the nomenclature intended to express the ideas to be conveyed. In the development of a language intended to express the ideas of any cult or science, it is of the utmost necessity that at the beginning the words chosen should clearly define the thing described, and only those should be selected and adopted. It is an axiom in philology that at the beginning words are simply arbitrary and may have no primary relation to the thing they are used to express, but in a long term of years and by wide usage they become fixed and there is no power on earth to change them.

Orthodontia is a new science, and the truth is, accurate definitions of the terms used can only follow accurate and sharply defined ideas of the science itself. Therefore it is of the highest importance, it seems to me, that now, at the very beginning, we should insist that only such words and terms be selected and adopted as will most perfectly and clearly convey the idea intended to be expressed.

There is also another axiom or rather law of philology which must not be lost sight of, namely, that "One word may be used to express a whole group of ideas having relation one to another, but no word can ever be used to express two ideas which have no relation to each other." Hence it is that I would certainly—and I have done so on a former occasion—criticize our Committee on Nomenclature when it attempts to make articulation and occlusion, etc., express the same idea. These are things that cannot be expressed by one word, because they are dissimilar in every respect. It is also important, in the selection of a nomenclature to express a science, that terms which not only are applicable and have the most direct and perfect meaning of the thought which they are desired to convey be chosen, but that they be terms also which are not easily confused, are readily understood, and above all, that cannot be misapplied. Therefore very much of that which the essayist has presented in his paper is worthy of the most careful consideration and, I believe, adoption. The time has come when as a profession we must give heed to the language employed to express our scientific thought. If we are to be scientific and are to be regarded as a learned profession we must select those words only, and insist upon their adoption, which relate directly and express perfectly—or as perfectly as language can—the ideas which we desire to convey and to enforce in the teachings of this science.

Dr. J. Y. CRAWFORD, Nashville, Tenn. I wish to express my gratification at hearing this paper. In my experience with the National Dental Association and other associations, I have received as much help from Dr. Guilford as from anyone, and I thank him on this public occasion; but for the benefit of the younger members of the profession I wish to emphasize this important subject. I do not like the use of "mandible" for the lower jaw; I call it the lower jaw, and everyone understands what I mean. The proper use of language is the proper vehicle for the thought. Every distinctive vocation is like a nation; it must necessarily have a language. The literature of every nation depends upon the proper use and the beauty of its language.

Another thing to be considered is the object for which the language is used—the instruction to be given. In our selection of language and terminology in the different departments we must take into consideration the characteristics of the auditory, and I want to impress the thought upon the minds of the younger men that the best and most substantial language in the world is the direct, the simple language.

Dr. WM. H. TRUEMAN, Philadelphia, Pa. I know of no one in this country so well qualified to present this subject as the essayist. I suggest that the paper be referred to the National Association of Dental Faculties, with the request that they report at our next meeting their judgment regarding the terms now in dispute. There is no question that many technical expressions need to be more clearly defined, and that convenience and accuracy require the adoption of a fixed, logical standard of dental nomenclature. Those engaged in teaching have this matter constantly before them; they know best which are the most troublesome and ambiguous expressions, and may be trusted to select more acceptable ones. After their report has been received, and a nomenclature agreed upon and recommended by the National body, its general adoption will quickly follow. We can then urge the editors of our journals to adopt the terms and always use them, making all communications sent to them conform to the standard, just as they now insist on standard spelling and standard English.

A few years ago the chemical nomenclature was revised. A little later a formal gathering of newspaper editors agreed to simplify the spelling of many common words, and to eliminate troublesome diphthongs. The changes suggested were reasonable, and were promptly accepted. The first thing is to settle what terms are best, then have the changes sanctioned by some influential body. If the terms are reasonable and logical, they will soon become general; and if the teachers in the schools and the teachers in the journals work together, the reform will quickly be brought about.

Dr. James McManus, Hartford, Conn. I second the suggestion that this paper be referred to the National Association of Dental Faculties for them to take action upon and report at our next meeting.

The motion prevailed.

Dr. Guilford (closing the discussion). I can say very little more than I have already said in the paper without broadening the scope of the subject too much. The main object of language is to convey ideas. Someone has said that words are nothing more than tools. Dr. Crawford remarked that we should use such words as will correctly and intelligently convey the idea to the listener. But there is a difference: we may use words which the man we are speaking to will understand, and yet which will not be understood by people at a distance. For instance, we might speak about a vehicle and give it our peculiar name, and the same word if used in a foreign country would not be understood at all; but if we used such a word as "omnibus" which has a root that all understand, it would probably be comprehended by all. It is not simply the having a tool that will answer our purpose, but having the right one. If I were a carpenter and taught an apprentice to drive nails with a monkey-wrench, he could do it; but if after he had learned his trade he went to work in another shop he would find that he was not using the proper tool. We can drive the nail with a wrench or hammer, but the hammer is the proper tool to use. The scope of language should be as far-reaching as possible, and that is why in coining a term we should select those words that will be understood by as many nations as possible. They will understand it if we construct the word from Latin or Greek.

A great deal of our nomenclature cannot well be changed. Elimination is a slow process, because words that have become established by usage cannot well be dropped, but if we have them right in the beginning they will not need to be changed. Dentistry is old, while orthodontia is comparatively young.

. Dr. Guilford's paper was then passed.

The next order of business was the installation of officers.

PROPOSED AMENDMENT TO CONSTITUTION.

The following proposed amendment to the constitution of the association was then read by the secretary:

When for any reason a member of this association ceases to be a member of his state or territorial society, by that action his membership in this body is terminated.

(Signed) Herbert L. Wheeler.
N. S. Hoff.
J. C. Watkins.
W. N. Cogan.
T. P. Hinman.

The President then read a letter from the chairman of the Clinic Committee.

The association then adjourned.

A. H. Peck. *Recording Sec'y.*

(Report of Sections to follow.)

THE DENTAL COSMOS
A MONTHLY RECORD OF DENTAL SCIENCE.
Devoted to the Interests of the Profession.

EDITED BY
EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, FEBRUARY 1906.

EDITORIAL DEPARTMENT.

THE PASSING OF THE "INTERNATIONAL DENTAL JOURNAL."

In the December 1905 issue of the *International Dental Journal* announcement is officially made of its suspension of publication; the avowed reason as editorially stated being "the fact that the dentists of the first decade of the twentieth century in America are not prepared to accept, much less stand for, the principles that this journal advocates." This certainly meets the issue fairly and courageously, and we may add, in our judgment, sufficiently. But our regret is none the less sincere or deep that a journal which has done splendid service for the dental profession, which has consistently stood for the best attainment of which dentistry is capable, which regardless of criticism or of antagonism has endeavored to fulfill its purposes, should be compelled to go out of existence because of its allegiance to what seems to us to have been an impractical and utopian ideal.

What we conceive to be the fundamental error in the motive of the *International* is the variously expressed idea that there is some essential difference in the ethics of professionalism and the ethics of trade, or that the ethics of professionalism does not involve the ethics of business to precisely the same extent and degree that the ethics of business involves the ethics of professionalism. Both are based fundamentally upon common honesty and equity, and any other conception of this basic principle does not seem to us to accord with the facts. It is therefore a source of deep regret that inability or unwillingness to accept this view, and the tendency to read into professionalism something of a higher altruism which it is supposed to contain as an exclusive characteristic, has brought to at least a temporary end the career of usefulness of our highly esteemed contemporary.

Our regret is intensified by a reiteration in the valedictory editorial of what we have always felt was an unjust and unmerited criticism of that group of our professional periodical publications which the *International* has designated as "trade journals," the sole warrant for which attitude is contained in the fact that a large part of the cost of their production is borne by dental supply houses. The editor says: "The writer has no harsh word to express against our contemporaries, the so-called trade journals. Many evidences of good fellowship have been experienced from these, and while it is felt that their influence has been to the demoralization of the dental profession through the insidious poison of commercialism, they have lived up to, and been consistent with business ideals, and in their way have contributed to the practical knowledge of dentistry and thus indirectly have made it more perfect in its mechanical and scientific progress." But are these not, as a matter of fact, "harsh words?" Is it good ethics? Is it not a harsh thing to say of any man, any journal, any force in dentistry, that its influence has been to the demoralization of the dental profession through the insidious poison of commercialism? If the Editor of the DENTAL COSMOS believed for one moment that the sweeping charge above quoted were true, in the smallest degree, of his own editorial activities or of the influence which his journal exerts, no power in or out of dentistry could enforce his continuance in that relation. Such evidence as is attainable on that point indicates quite another conclusion as to the influence which the periodical literature of dentistry is exerting, even though much of it is "bound up in dollar journals."

We sincerely trust that the editor's promise that his forceful expressions of thought will still find their outlet in other avenues of publication may be abundantly fulfilled. The dental profession has been too long accustomed to look forward with pleasurable anticipation to his periodical visitations to willingly give up that pleasure while he may be disposed to write. If it has meant labor, it has in greater measure meant service such as cannot be dispensed with; but we hope that, when divested of official and representative relation to what we regard as an ethical misconception, the lifting of that handicap may permit him to view the professional journalistic problem with a more generous regard for the ethical aspects of his "contemporaries the so-called trade journals."

HENRY MARTYN LEWIS.

WITH deep regret we announce the death of HENRY M. LEWIS, President of The S. S. White Dental Manufacturing Company, which occurred early on Friday morning January 26, 1906, as this issue is going to press. A detailed notice will be published in our March number.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by **JULIO ENDELMAN, D.D.S.**

[*Gazette des Hôpitaux*, Paris, 1905, No. 45.]

CARE OF THE MOUTH AND TEETH. By Dr. Legendre, Paris.

The essayist calls the attention of his medical *confrères* to the advisability of systematically examining the mouths of their patients, not only in cases of oral diseases, but likewise when called upon to treat pathologic conditions affecting the deep-seated organs.

The evolution of the dental organs in the infant may give rise to convulsions, gingivitis, and concomitant dyspepsia, and in extreme cases enteritis; in the adolescent and adult, to congestive angina, and many other disturbances such as circumscribed alopecia, etc.

Dental caries is in a large majority of cases responsible for the loss of the teeth, a condition which in turn is accountable for the presence of dyspepsia and other digestive disturbances through insufficient mastication and insalivation. To dental caries can in the same way be traced systemic disorders of toxic nature, infection of the oral and adjacent structures, ulcerative angina, Vincent's angina, maxillary sinusitis, and even abscesses of the floor of the mouth and structures of the neck. Dr. Legendre emphasizes the necessity of educating children to use the tooth-brush often. It is impossible to foretell what injurious consequences may follow protracted disregard of the hygiene of the mouth and teeth. In years gone by it devolved upon the dentist to point out to his patients the fact that an unclean mouth with carious teeth and roots, loose gums forming admirable pockets for the lodgment of food débris, and infectious materials of every imaginable variety, afforded the widest and easiest entrance to the causes of those deep-seated, more far-reaching troubles which in more than one case, as recorded in the literature of the subject, have been the responsible factors of fatal terminations.

In the past five years, the burden of this phase of the duties of the dental surgeon has been materially lessened by the intelligent assistance and helpful collaboration of the medical practitioner, whose word, because of reasons obvious to all, means more and bears greater fruit on the part of the patient, than that of the dental surgeon often construed as an evidence of professional enthusiasm, rather than as the outcome of careful observation, clinical experience, and a commendable desire to be of help to his fellow men not only in the sphere of his professional activity, but as an admonisher of impending evil.

[*La Revue de Stomatologie*, Paris, December 1905.]

TWO CASES OF SALIVARY LITHIASIS. By F. Bassères, Surgeon of the Military Hospital of Perpignan.

The two cases reported by the author are of unusual interest, as their clinical history embraces what may be considered as the typical symptoms of salivary lithiasis. The first case was that of a man twenty-five years of age, who consulted one of the army surgeons stationed at Perpignan barracks because of the appearance upon the right submaxillary region of a swelling which gave rise to intense pain. The patient's history as well as that of his family was normal, with the exception perhaps of a slight acne vulgaris of no pathological significance, from which he was suffering at the time of the appearance of the tumefaction. Four days after the onset of the attack, the disorder became complicated by the appearance of a swelling on the floor of the mouth of the affected side, concomitant with the development of an additional swelling of voluminous size and decidedly painful immediately behind the original tumefaction. The tumor in the submaxillary region was slightly movable, renitent, and the overlying epidermis while not edematous was, however, hot and sensitive to the touch. If pressure was brought to bear upon the tumor, the patient at once experienced a sensation as if a discharge of a salty matter were taking place. The examination of the mouth revealed the presence of an oblong tumor, reddish, painful, and of about the size of an ordinary almond. It did not encroach upon the tongue and anteriorly was separated from the alveolar arch by a well-defined groove.

The functional symptoms observable at first were slight, inasmuch as mastication, speech or deglutition were but slightly interfered with, but upon the tenth day became very severe. The tumor on the floor of the mouth was now very painful, so much so that even the slight touch of the tongue gave rise to almost unbearable sensations. Its size had now considerably increased, thereby interfering not only with the functions of mastication, but likewise with those of phonation and speech. Shortly after the aggravation of the symptoms, the tumor burst open spontaneously, the patient experiencing at the same time the presence within the mouth of two small bodies which had thus been expelled from the tumor. They were two separate calculi weighing respectively gm. 0.094 (about 1 3/5 grains), and gm. 0.166 (about 2 7/10 grains), of dense texture and consisting mainly of tri-calcium phosphate and calcium carbonate. Complete recovery soon followed.

The second case reported by the author was that of a man aged nineteen, who presented a swelling of the structures of Wharton's duct at a distance of about six millimeters from the ostium. Although the swelling was extensive and unquestionably caused by the presence within the canal of a calculus, it gave rise to no appreciable discomfort. It was not removed, as the patient refused to submit to the required surgical operation. The author calls attention to the difficulty in certain cases of diagnosing the presence of calculi, located either in the parenchyma of glands, or within the ducts. Cases of salivary lithiasis have been erroneously diagnosed as infectious adenitis, Ludwig's angina, etc. The clinical history of cases of buccal inflammation, especially when in the neighborhood of the salivary glands or upon the floor of the mouth, should be carefully studied before reaching a diagnosis. The intermittent swelling of any of the salivary glands during mastication or shortly afterward may be construed as a symptom of glandular obstruction by salivary concretions, and this together with the data which may be obtained from the patient, such as the presence of continuous feeling of uneasiness about the mouth, the date of inception of the disorder, etc., should help the diagnostician in reaching a correct conclusion.

[*Journal of the American Medical Association*, November 11, 1905.]

TREATMENT OF ACTINOMYCOSIS AND BLASTOMYCOSIS WITH COPPER SALTS. By Dr. A. D. Bevan.

The author has successfully experimented with the copper salts in the treatment of actinomycosis. He begins with a dose of about one-quarter of a grain of copper sulfate three times daily, gradually increasing the dose to one grain. In abdominal cases, in addition to the administration *per os*, the author employs colonic irrigations of a one per cent. solution.

[*Trans. Odontological Society of Great Britain*, London, November 1905.]

THE TREATMENT OF NECROSIS OF THE JAWS. By H. A. T. Fairbanks, M.S., F.R.C.S.

The author discusses the subject under four headings, classifying the cases according to their causes: (1) Cases due to traumatism; (2) those due to the invasion of the bone by ordinary pyogenic organisms—this class includes the majority of cases; (3 and 4) those due to tuberculosis and syphilis respectively.

Exanthematous necrosis, so called, the author does not deal with separately, because he believes its designation as a separate and distinct disease is based upon a misconception of the cause of the necrosis in cases included in this group. The necrosis is in no way a specific effect of the particular fever from which the patient happens to be suffering, except perhaps in the case of typhoid fever. Speaking generally, necrosis of the jaws occurring during the course of or during convalescence from an attack of one of the exanthematous fevers, is due to the invasion of the bone by septic organisms from the mouth or the blood. The septic condition of the mouth during the acute stage of the fever; the ulceration of the gums so often met with; the rapid caries which may attack the teeth; the debilitated condition of the patient, and the increased number of organisms finding their way into the blood, all favor the occurrence of necrosis of the jaws in a patient suffering from one of the specific fevers. Such cases are interesting from the point of view of prophylaxis rather than treatment. The latter in no way differs from that suitable for ordinary uncomplicated cases of equal severity. As to prophylaxis, careful nursing is of the highest importance. The greatest care should also be taken to keep the mouth as clean as possible. Dr. Austen has called attention to the necessity of using the utmost gentleness in cleaning the gums and throat. He believes that traumatism plays an important part in the causation of the necrosis, which often attacks the lower incisor region. Ulceration of the gums should be treated promptly by the administration of the usual remedies.

The ordinary cases of septic or infective necrosis of the jaw may be arranged in three groups, each group being distinguished by a particular mode of infection of the bone. The micro-organisms may reach the bone: (1) Through a tooth or its socket; (2) through the gum; (3) through the bloodvessels. The first is the commonest mode of infection. The second occurs particularly in children, whose powers of resistance have been lowered by unhealthy surroundings or by acute illness. The disease usually affects the body of the jaw, particularly in the region of the angle, or the ascending ramus. These cases the author thinks are more common than is generally supposed. Suppuration around an impacted third molar is often the result of such auto-infection. This "acuteness" of the symptoms varies considerably in different cases, just as it does in the case of acute necrosis of any other bone.

Necrosis of traumatic origin may result in one of three ways: (1) In a comminuted fracture, a fragment of bone, especially of the alveolus, may be so separated from its periosteum that it dies immediately; (2) infection of the fractured surfaces may take place from the mouth, and necrosis follow; (3) a blow on the jaw may determine the deposit of organisms from the blood, and acute necrosis result. Tubercular and syphilitic necrosis are of interest to the dental surgeon more, perhaps, from the point of view of diagnosis than of treatment. They differ from similar disease of other bones only in the fact that it is so often impossible to exclude septic infection of the diseased tissues.

As to syphilis, the jaws are affected in the tertiary stage. The disease in the mandible may be local, when it is usually osteoplastic or diffuse, generally leading to necrosis. The treatment used is that suitable for the general disease, combined with incisions for drainage when necrosis occurs. In the maxilla the hard palate is of course the favorite seat of the disease, though the whole of the jaw affected may die. The treatment in this case consists in the administration of iodids in large doses, with the removal of sequestra when loose.

In cases of fracture of the jaw the frequent use of antiseptic mouth-washes is of the highest importance. A fluid diet may be taken through a short rubber tube which is fitted to the nozzle of a feeding-cup and passed to the back of the mouth. Fragments of bone which have been separated from their periosteum to such an extent that their death is inevitable, if such has not already occurred, should be removed at once. In this particular only, does the treatment of these cases differ from that suitable to all ordinary cases of necrosis of the jaw.

Discussing the type of necrosis due to infection, the author says that it is well known that the maxilla is much less liable to be affected by necrosis than the mandible. The prognosis is also much better in cases of necrosis of the maxilla than it is in those affecting the mandible. Dr. Fairbanks thinks we can limit the necrosis by obtaining free drainage through an incision from the outside. He is well aware that cases have been reported in which large portions of the jaw, even the whole mandible, have been removed through the mouth without external excisions, and that these cases have recovered. Admitting that such may occur, the author quotes his own experience against these isolated cases. A few years ago he looked up the records of some fifty odd cases of necrosis of the jaw which had been admitted to the Hospital for Sick Children, Great Ormond street. In forty-eight of these cases the mandible was the seat of disease, and in all but two of them an external opening was sooner or later present. Some came in with a sinus, others had an incision made into a pointing abscess, yet others left the hospital without a sinus, only to return with one, or with an abscess requiring immediate incision. Of the two which were never opened outside the mouth, one died of meningitis—no post-mortem—the other had two large sequestra removed from the mouth, was then discharged with a large cavity in the latter, and finally lost sight of. From subsequent experiences of cases occurring in adults as well as children, the author is of the opinion that the results of that series of cases are by no means misleading. If the lower border of the mandible is involved, an external incision he thinks is imperative, even if the pointing of the pus does not deprive the surgeon of any choice in the matter. It is in the cases particularly in which the limits of the necrosis are indefinite, and in which the bone at the level of the inferior dental canal is dying or dead that the difficulty arises. It is in these that drainage into the mouth is almost, but not quite sufficient.

If infection reaches the bone through the blood an external incision is imperative, as the pointing of the pus on the surface without much swelling in the mouth, generally leaves us no choice in the matter. The body of the jaw and the ascending ramus seem more liable to infection by this means than does the alveolar portion, though the disease may spread to the latter. The treatment of this condition is carried out on the lines laid down in text-books for the treatment of acute necrosis of bone generally. There is yet one other class which may be discussed with the foregoing; the hyperacute cases of diffuse osteo-periostitis, in which the course is rapid, the constitutional symptoms grave, the disease extensive, even the whole mandible dying, and the end too often death. Such cases are met with in patients whose resisting power is lowered from some cause or other.

If an external incision is to be made, where should be its place? It should be made parallel to the jaw and just under cover of its lower margin, in front of or behind the point where the facial vessels cross the jaw, or both in front of and behind this point. If necessary the facial vessels may be secured above and below and divided, no harm resulting from such division. If the ascending ramus is the seat of the trouble, the incision should be made below the angle and a pair of sinus forceps passed up between the thickened periosteum and the bone. The object is to drain the cavity containing the dead bone, and in most cases to drain the mouth as well. To obtain this the shell of bone, if such has had time to form, will have to be broken through. A probe may sometimes pass through a hole in the lower border of the jaw, and emerge into the mouth through an empty tooth-socket. In such a case it is as well to enlarge the hole in the bone so that a drainage tube may be inserted as far as the bottom of the socket. The author prefers rubber tubes to gauze for drainage purposes, as they are not only more efficient, but they also keep the sinus open better than does a wick of gauze. These sinuses have a great tendency to contract, with the result that drainage through them becomes imperfect. The tube may be fixed to the skin by a stitch when first put in.

The question of the advisability of removing sound teeth which have become loose is an old one. In a severe case with the disease spreading rapidly, we need not hesitate to remove a sound tooth, but in cases of moderate severity we should endeavor to make out whether the alveolus around a loose but otherwise sound tooth is itself necrosed, or whether it is only sharing in the inflammation existing. We should, therefore, not be in too much of a hurry to extract a tooth, unless as already indicated the case be severe and the constitutional symptoms grave.

As to the removal of the sequestrum, this should be delayed till the process of separation is complete. This means a delay of some weeks, the number varying with the size and hardness of the portion of bone that has died. Sequestra should be removed through the mouth if possible, the internal sinuses being enlarged as much as is necessary. Sequestra, which include portions of the alveolus, would naturally be removed in this way. When the alveolus is not involved the sequestrum is sometimes better removed through the external sinus, the sinus not being enlarged more than is absolutely necessary. The amount of thickening of the jaw is no criterion of the size of the sequestrum. The utmost gentleness is necessary to avoid fracture of the sequestrum and incomplete removal. When the disease involves the ascending ramus, it is as well to discard all bandages which restrict the movements of the jaw at as early a date as possible, so as to avoid the occurrence of adhesions and ankylosis in the temporo-maxillary articulation (Schlatter).

The new bone which replaces the sequestrum even to the extent of a new mandible is said to be gradually reabsorbed. It is to be hoped that the early insertion of a denture might prevent or limit this atrophy. In the case of a child, gnawing the harder forms of food should be encouraged. In cases accompanied by ulceration of the gums, the formation of new bone is often somewhat scanty by reason of the destruction of some of the periosteum. As to the uses of mouth-washes, etc., syringing seems preferable to simply rinsing out the mouth with the lotion. Particularly is this the case when a mass of dead bone is exposed in the mouth. What lotion is used matters little. The old friend containing liquor potassæ and carbolic acid in equal quantities is as good as any. Mr. R. S. Fairbank adds some iodoform to the lotion, so that a fine powder may be deposited all over the wound.

[*Revue de Stomatologie*, Paris, December 1905.]

HYPERIDROSIS CAUSED BY MASTICATION. By Dr. Darguies.

The author reports the case of a woman of thirty-nine in whom the movements of mastication stimulate the sweat glands in the sterno-mastoid and infra-orbital regions. The perspiration appears in those regions regardless of the season of the year, whether it be summer or winter, beginning immediately after mastication has begun and ceasing at the end of the meal. It is at times so intense as to materially interfere with the comfort of the patient. A case very similar to this has been reported in the past. In the latter case the patient was a French army officer and the hyperidrosis was localized in the right parotid region. Its cause was traced to a blow against the mandibular angle of the same side.

PERISCOPE.

Hemostatic and Stimulating Properties of Bismuth Subiodid.—Bismuth subiodid dusted on an oozing granulated wound promptly stops the bleeding. It is also an excellent stimulant to the growth of epithelium.—*Amer. Journ. of Surgery.*

Hot Air in the Treatment of Pyorrhea Alveolaris.—I have no doubt that hot air would be valuable in such cases. In the treatment of empyema of the antrum, after an opening is made large enough to get access to the cavity, and after polypi and other growths are taken away, I find one of the valuable assistants in effecting a cure is to dry the cavity out well with warm air. We obtain a dry surface, and when we apply our remedies they penetrate more deeply into the tissues than they otherwise would. We know that the bacteria that are constantly present sometimes become well embedded in the substance of tissues.—Truman W. Brophy, *Dental Review.*

To Remove Rust From Instruments.—*Pharmaceutische Centralblatt* prints an effective process for removing rust from surgical instruments. The instruments are placed over night in a saturated solution of stannous chlorid, which causes the spots to disappear by reduction. The articles are then rinsed in water, laid in a hot solution of soda soap, and dried. It is well to rub them with absolute alcohol and prepared chalk. Another convenient method for removing rust is to lay the instruments in kerosene. Paraffin oil is the best preservative against rust, and the most convenient way of applying it without getting an unnecessarily thick coating is as follows: One part of the oil is dissolved in 200 parts of benzine, and the objects, after being thoroughly dried and warm, are plunged into the solution. Instruments with joints, as scissors or needle-holders, are washed in the fluid, so as to cause it to penetrate into all crevices, and the benzine is then allowed to evaporate in a dry room.—*Med. Standard.*

Effect of Copper Sulfate upon the Bacteriological and Chemical Constituents of Large Bodies of Water.—Stokes and Thomas come to the conclusion that in fairly pure water a dilution of 1 to 100,000 copper sulfate can be depended upon to greatly reduce the algæ and fermentative bacteria, and also to clear the water by precipitating the matter in suspension. In moderately polluted water the fermentative bacteria are not destroyed.—*Amer. Medicine.*

A Plea for Conservative Dentistry.—The man that so far forgets his profession as to indiscriminately sacrifice teeth that he may replace them with artificial dentures, having an eye to the purely prosthetic, is on a par with the man that can only see in the mouth of his patient an opportunity for crowns and bridges. And here we must not be understood as condemning either, in their proper place, but we think that the career of many a young practitioner has been marred by just such a false notion.—H. WOODBURY, *Dominion Dental Journal.*

Monochloracetic Acid as a Pulp-canal Disinfectant.—This substance is easily soluble in water, preferably in copper-sterilized water. When a tooth is washed or irrigated with a solution of from five to ten per cent. of the acid it will soon be rendered sterile. You may seal it into the pulp-chamber with perfect ease, as the gases of decomposition will be destroyed as rapidly as they are formed. It is colorless and will not stain. It is a disinfectant in the sense that it destroys infectious material in the same manner in which heat does.—A. W. HARLAN, *Items of Interest.*

A Point in Cavity Preparation.—Gold unannealed, or but partially annealed, can with proper manipulation be brought into such close contact with the walls and edges of a cavity as to practically hermetically seal it, thereby insuring it against the further inroads of decay. To secure results approaching perfection in this particular it is the writer's idea that the cavity should be so formed as to give the operator as nearly direct access to the various cavity walls as it is possible to secure. In other words, it is extremely difficult to adapt and condense gold by working "around a corner." The same rule applies to obtaining condensation at the edges—pressure being applied as nearly as possible at right angles to the edge to be covered.—A. J. ELMER, *Dental Review.*

Continued Mild Medication in the Treatment of Pyorrhea Alveolaris.—There is a feature of the treatment of pyorrhea which it would seem ought to be as universally accepted as being as logical and practicable as the removal of accretions, the adjustment of the occlusion, or the giving to loose teeth surgical rest. This feature of treatment I will speak of in a general way as "continued mild medication." This medication may be the obtaining of a condition which will give to the tissues continued mild stimulation, a continued mild astringent effect, or possibly in some stages a continued mild sedative effect; probably in all cases a continued mild sterilizing effect being called for.—W. V-B. AMES, *Dental Review.*

Advantages of the Bandless Porcelain Crown.—Among the advantages of a bandless porcelain crown over any crown with a band are the following: A bandless baked porcelain crown, when plate, post, and facing are used—if the plate be properly burnished to the root to be crowned and the facing soldered to the post, the facing being ground so as to have the same contour as the end of the root and polished so as to have a smooth surface throughout—is perfectly healthy and non-irritating to the gum, because it has practically the same contour and a similar surface to the original tooth. The gum between the crown and the tooth will remain intact and perform its normal function, and the liability to irritation is reduced to a minimum since the crown and the root form one continuous smooth surface and are more harmonious with the gum tissue.—U. M. RICHARDSON, *Dental Review.*

Carving-Wax for Crown and Bridge Work and Other Uses.—Take pink baseplate gutta-percha one sheet, and one sheet of pink paraffin and wax, the same as that used for waxing base-plates. Melt the wax with dry heat and then put the gutta-percha in and stir until the gutta-percha is melted, then pour out on a plate and let the mixture cool. Common beeswax makes just as good a product, only the color is lighter. Be sure to use dry heat. Keep at a high temperature all the time; if it takes fire blow it out. I find the best vessel for melting it to be a granite dipper with a long handle, stirring with a steel spatula until the gutta-percha is melted. This material is to take the place of modeling composition and plaster in crown, bridge, and gold inlay work. It carves nicely and smoothly without chipping or flaking. If you trim off a little too much, just warm a shaving and stick it on with a warm knife-blade; burnish it down. The carving blade should be warmed just a little to make it cut smoothly.—C. BOYD POWELL, *Dental Brief.*

Medical Features of the Papyrus Ebers.—Carl H. von Klein gives a synopsis of the so-called Ebers' papyrus. This papyrus was purchased by the great German orientalist, Ebers, from an Arab near Thebes on the Nile in 1873; it having been found in the so-called El Assyat part of the necropolis of Thebes, between the legs of a mummy. It is one of the best-preserved papyri known to Egyptologists, and is written in an extraordinarily regular hieratic script, partly in black and partly in red ink. Although the exact date of the writing has not yet been established, it seems to be accurate to state that it was compiled, revised, or re-written about 1552 B.C. But the many corrections made by strange hands and the many critical marginal notes found throughout the papyrus show that the document was afterward worked on. It embraces a large proportion of the diseases known to modern medical science, which are carefully classified, their symptoms minutely described, and their treatment given.—*Journal of the American Medical Association.*

To Make a Temporary Crown in Ten Minutes.—In crowning anterior teeth you all have cases in which the patient objects to appear in public minus a tooth, even for a few hours, and you find on looking over your stock that you have nothing suitable for the case, or even if you have, your time is so taken up that you cannot give him proper attention. You can solve the difficulty in a few minutes by first selecting from your plate or rubber teeth one of the proper size and shade; then take a Davis post or make one of almost any convenient material (German silver will do nicely), and insert one end between the pins of the tooth and squeeze the pins together to hold it in position; tack with soft solder by passing carefully through the flame of a Bunsen burner; try in the mouth and adjust the post; then pack any easily softened gutta-percha about the post and palatal portion of the tooth, and while soft press it to place in the mouth, holding the crown firmly between the thumb and forefinger in such a way that the gutta-percha will be forced about the root of the tooth; remove, and trim away any excess of gutta-percha, and set as an ordinary crown.—C. F. GRAHAM, *Dominion Dental Journal.*

Tooth and Nail Corrugations.—Excepting Hutchinson's notches, the corrugations of the teeth and nails are not much mentioned in medical literature, and G. Lenox Curtis, New York (*Journal of the American Medical Association,* August 5th) remarks that this neglect is a mistake, and that they have a decided pathological significance. From the study of many cases he is satisfied that the transverse lines on nails and teeth are caused by auto-intoxication resulting in rheumatism, and that the severer the attack the more prominent are they. Children whose mothers suffered from rheumatism during pregnancy, and those that have rheumatism themselves during the period in which the enamel of the permanent teeth is developing show these corrugations. The longitudinal indentations on teeth and nails, Curtis thinks due to auto-intoxication from intestinal indigestion, and that white spots on the nails also indicate auto-intoxications. When these markings are absent, a corresponding absence of the diseases may be assumed. The nail markings have importance owing to the fact that they are temporary, being obliterated in a month or two by the natural growth of the nail. They are, therefore, indications of recent disease.—*Cyclopedia of Practical Medicine.*

Crowns.—I have done much crown work, my experience even going back to resetting a few old hickory pivots. I have followed all the fortunes, good and bad, of Bonwill and Richmond, and all their modifications, and I have arrived at the conclusion that there is only one crown possessing all the qualifications of beauty, strength, and durability, and that is a porcelain crown on a banded platinum base—the Richmond crown with platinum band and solid porcelain top. There is one point I wish to bring out first, which I do not remember having seen in print, and that is the tolerance of the gums to platinum bands and bridges. The gums do not recede, but, on the contrary, embrace the band, and are perfect in color and cleanness. Gradually I have worked out a method which is simple and easy, and the result is quite perfect; but yet it takes much time, and I hope I shall be able to shorten it. I dare say you have all made similar crowns, but my method may be of interest: I trim the root as for a Richmond crown, only smaller, fit a copper band to the root, and with that as a model have a seamless platinum cap struck up, which I fit to the root. I then decide whether the pin is to be a part of the root or of the tooth. Generally I prefer to set a screw-pin in the root. In this case I put a hole in the cap and solder a very thin platinum tube to it, through which the pin projects when set. The tooth is carved and baked on this base, and generally set with gutta-percha. It is equally valuable for bridge-work piers; and so easy to do that wonderfully good work can be done upon the roots of the posterior teeth. In the other case the pin is soldered to the cap, through which it projects externally to aid in holding the porcelain.—HARRY F. HAMILTON, *Internat. Dental Journal.*

Alcohol in General and Special Therapeutics.—There is probably no agent that can be more universally used for cleansing purposes than alcohol. It has the property of breaking up and removing fatty or mucoid substances from the gingival border and the teeth that are to be included in the rubber dam, when this appliance is to be used, in the filling or opening up of devitalized teeth. It has a solvent action upon the putrescent material in root-canals, as well as a decided restraining influence on the developmental processes of bacteria. It is an excellent remedy to be applied on burns produced by carbolic acid or any of the phenol derivatives, and if applied to the tissue immediately it arrests the escharotic effect. Many dentists who are in the habit of using alcohol are frequently inclined to be too free with it, pumping it into root-canals even after all of the moisture has been removed from such canals, and in such cases it may at times become very irritating and produce very much the same condition in the soft tissue as that produced by other irritating agents. Therefore alcohol should be used with great care. Alcohol may be used with success in chronic alveolar abscesses, especially those with fistulous openings, inasmuch as its irritating property will be of sufficient consequence in producing stimulation to the tissue cells and removing certain extraneous matter, such as broken-down tissue cells, and many of the bacteria found inhabiting such tissue, all of which is very essential in bringing about restoration of the parts.—GEORGE W. COOK, *Amer. Dental Journal.*

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OBITUARY.

DR. CHARLES C. CHITTENDEN.

DIED, December 15, 1905, at Madison, Wis., after an illness of several months, CHAS. C. CHITTENDEN, D.D.S., in his sixty-fourth year.

In the death of Dr. Chittenden the dental profession loses a distinguished member, one whose meritorious qualities are reflected not only in the work of his vocation, in his relationship to his fellow practitioners, in his efforts toward the advancement of his profession, but likewise in every phase of his activity, whether professional or otherwise.

Born in Nunda, Livingston County, New York, May 10, 1842, he spent the first thirteen years of his life in the healthful surroundings of that mountainous district. In 1855 he moved to Madison, where his father, the late Nelson Chittenden, had preceded him, foreseeing the possibilities of the rapidly growing West. He began the study of dentistry under the guidance of his father, a practitioner of unusual skill and superior knowledge. Dr. Chittenden entered the ranks of the profession as an active member in 1863; at first in partnership with his father, with whom he practiced until the latter's death in 1875. He later practiced alone, until 1895, when he formed the partnership with Dr. William H. Mueller, which continued until the death of Dr. Chittenden.

During the Civil War he enlisted in the Eleventh Wisconsin infantry, at Madison, October 23, 1861. He served as a fifer in the regimental band, and shared in the vicissitudes of the regiment at Sulphur Springs, Mo.; at Pilot Knob, at Jackson Port, on the White River in Arkansas, and at Batesville and Helena, in the same state. Dr. Chittenden's war career ended November 24, 1862, when, after a year and one month of service, the regimental band was mustered out.

Dr. Chittenden—a man of education not only in the line of his profession, but in the broad sense of the word—has occupied a foremost position among his professional co-workers. His ability, professional altruism, and chivalrous characteristics were by them justly and publicly recognized upon manifold occasions. He served as president and chairman of the Committee on Colleges of the National Association of Dental Examiners. In 1885, when the Wisconsin State Board of Dental Examiners was created by law, Dr. Chittenden was appointed a member of that body, and with the exception of two years, he served continuously as its president. He was likewise president of the Madison Odontological Society, and one of the honors which lately came to him was the presidency of the National Dental Association for the session 1903-04. His incumbency of the latter office embraces the period of the holding of the record-breaking Fourth International Dental Congress, where, as representative of the national body, he addressed the congress at its opening session, welcoming the foreign contingent which had gathered in St. Louis from all civilized countries to do honor to dentistry and to the hospitable invitation tendered by the American hosts. Upon that occasion he uttered words which, because of their sincerity of purpose and uplifting aim, may be construed unreservedly as the creed of the man. He said: "Great undertakings can only be brought to a successful issue by a careful, well-planned course of procedure and development, controlled by an intelligent comprehension of the objects sought to be attained. Time, patience, and unswerving courage and fidelity—regardless of all personal sacrifice—must be freely thrown into the balance by those who undertake to create and set in motion the machinery required to successfully bring together representative men from all the civilized nations of the earth for the uplifting of a common cause."

Dr. Chittenden was married on May 18, 1867, to Miss Virginia Carr Winter of New York. She died March 5th of the following year. He is survived by three sisters. Mrs. Flora E. Devendorf of Berlin, Wis.; Mrs. L. C. Stewart of Waupun, Wis.; and Miss Kate A. Chittenden of Madison, Wis.

RESOLUTIONS OF REGRET.

IN respect to the memory of Dr. Chittenden, the Odontological Society of Madison, on December 16, 1905, adopted the following resolutions:

Whereas, The hand of Providence has removed from us our honored member and president, Dr. Charles C. Chittenden; and

Whereas, In his decease we have lost one of the founders of our association, who as president and as an active member until his death, evinced a warm interest in its welfare. As president of the National Dental Association, president of the National Association of Dental Examiners, and also president of the State Board of Dental Examiners for many years, he gave freely of his time and energy, sacrificing his health for the advancement and betterment of dental education, and in many years of practice set before us a worthy example of fidelity to his patients, and kindly interest in his younger professional brethren; therefore be it

RESOLVED, That we desire to express to his bereaved family our sympathy and sorrow in their affliction, and our admiration for the professional and personal qualities of our member; and be it further

RESOLVED, That these resolutions be spread upon the records of our association, a copy sent to the family of our departed brother, and others to the dental journals for publication.

W. H. MUELLER,
O. C. SCHMEDEMAN,
F. T. MCCONNELL,
Committee.

THE Milwaukee Odontological Society, at its meeting December 16, 1905, adopted the following resolutions:

Whereas, We have learned today of the death of our dear friend and eminent professional brother, Dr. Chas. C. Chittenden; therefore be it

RESOLVED, That the Milwaukee Odontological Society, in special meeting assembled, extend to Miss Chittenden, and to other near relatives of our friend, our sincere and heartfelt sympathy; also be it

RESOLVED, That as individuals we mourn the loss of a friend whose loving and lovable qualities of mind and heart, and whose high personal character, drew to himself and held the affection and respect of men to a degree which few men have ever been privileged to enjoy; also be it

RESOLVED, That by his life-long devotion and self-sacrifice, and by his untiring and successful work in national and state bodies for the advancement of dentistry, he has rendered an ever-enduring service to his profession and the public, and builded for himself an imperishable monument. And be it further

RESOLVED, That these resolutions be spread upon the records of this society, and a copy be sent to Miss Chittenden at Madison.

W. H. CUDWORTH, *President,*
ADOLPH GROPPER, *Sec'y.*

SOCIETY NOTES AND ANNOUNCEMENTS.

AMERICAN DENTAL SOCIETY OF EUROPE.

THE next meeting of the American Dental Society of Europe will be held at Berlin, Germany, August 2, 3, and 4, 1906. A most cordial invitation is extended to members of the profession to be present.

An interesting program is already assured, and it is hoped to make this one of the most interesting and largely attended meetings in the history of the society.

GEO. O. WEBSTER, *Hon. Sec'y*,
Pariser Platz I, Berlin, Germany.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE forty-second annual convention of the Connecticut State Dental Association will be held in Bridgeport, Conn., Tuesday and Wednesday, April 17 and 18, 1906.

F. HINDSLEY, *Sec'y*,
Bridgeport, Conn.

G. V. BLACK CLUB.

MIDWINTER CLINIC.

THE G. V. Black Dental Club of St. Paul will hold its annual midwinter clinic at the Old Capitol building in St. Paul on February 22 and 23, 1906. An unusually interesting program is being arranged by the program committee. There will be all classes and kinds of dental operations, such as gold and amalgam fillings, porcelain and gold inlays, gold and porcelain crowns.

Such well-known men as Drs. Searl, Clack, Beemer, Lewis, Moyer, Wells, Bond, James, Gallagher, Richardson, Conzett, Robinson, Pherrin, Crandall, Work, and others will operate.

Dr. Truman W. Brophy of Chicago will make a surgical operation. Essays will be read by Drs. G. V. Black, C. N. Johnson, and T. W. Brophy of Chicago, Alfred Owre of Minneapolis, Minn., and Conzett of Dubuque, Ia.

There will be a number of table clinics of more than ordinary interest. Special attention has been given the exhibits.

Railroad rates—one and one-third fares plus 25 cents, certificate plan.

The profession generally is invited to attend. For further information apply to

R. B. WILSON, *Sec'y*,
107 E. 6th st., St. Paul, Minn.

NEW HAMPSHIRE DENTAL SOCIETY.

THE twenty-ninth annual session of the New Hampshire Dental Society will be held at the Pemigewassett House, Plymouth, N. H. (Gateway to the White Mountains), May 8 and 9, 1906.

F. F. FISHER, *Sec'y*,
Elm st., Manchester, N. H.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-eighth annual meeting of the New York State Dental Society will be held at Albany, N. Y., Friday and Saturday, May 11 and 12, 1906. Saturday afternoon will be devoted exclusively to clinics.

Any ethical member of the profession having anything of interest to present, or desiring to clinic, will kindly communicate with the Clinic Committee, as follows:

F. MESSERSCHMITT, *Chairman*,
1023 Granite bldg., Rochester, N. Y.
W. D. TRACY,
46 W. 51st st., New York city.
G. B. MITCHELL,
448 Porter avenue, Buffalo, N. Y.
G. A. SULLIVAN,
18 Dove st., Albany, N. Y.
F. W. PROSEUS,
238 Monroe ave., Rochester, N. Y.

ODONTOTECHNIQUE SOCIETY OF NEW JERSEY.

The Odontotechnique Society of New Jersey, a new society formed about a year, has recently been incorporated at Trenton.

The regular meetings of this society are held on the first Saturday evening of each month, at 842 Broad st., Newark, N. J.

Officers for the present year are, Dr. R. B. Van Gieson, president; Dr. Theo. R. Harvey, vice-president; Dr. J. P. Knef, secretary; Dr. J. S. Voeghtlen, treasurer.

J. P. Knef, *Sec'y*,
238 Ferry st., Newark, N. J.

WISCONSIN BOARD OF DENTAL EXAMINERS.

The next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates for license to practice dentistry in Wisconsin will be held in Milwaukee, January 29, 1906, at the Hotel Pfister.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry for four consecutive years, or an apprentice for five years to a dentist engaged in the reputable practice of dentistry.

For further particulars apply to

J. J. Wright, *Sec'y*,
1218 Wells bldg., Milwaukee, Wis.

MASSACHUSETTS BOARD OF REGISTRATION.

A meeting of the Massachusetts Board of Registration in Dentistry, for the examination of candidates, will be held in Boston, Mass., March 7, 8, and 9, 1906.

All applications, together with the fee of twenty dollars—if first examination—must be filed with the secretary of the board on or before February 28th, as no application for this meeting will be received after that date.

Hereafter candidates for second and subsequent examinations will be required to fill out an application blank and forward it to the secretary as above.

Every candidate for examination must be twenty-one years of age.

Application blanks may be obtained from the secretary.

Temporary licenses are never granted.

The fee for third and subsequent examinations is $5.00.

G. E. Mitchell, *Sec'y*,
25 Merrimack st., Haverhill, Mass.

ARMY DENTAL CORPS.

Leave for two months, to take effect on or about Dec. 18, 1905, is granted Dental Surg. William H. Ware. (Dec. 13, W. D.)

Dental Surg. Croxton L. Rion will proceed to Iloilo, Panay, for duty. (Nov. 6, Phil. Div.)

Dental Surg. George H. Casaday from duty in the Philippines Division, and will proceed by the first available transport sailing after Feb. 1, 1906, to San Francisco, for further orders. (Dec. 15, W. D.)

Dental Surg. George I. Gunkel from duty at Jolo, Jolo, to Cotabata, Mindanao, for duty. (Nov. 2, D. Mind.)

Dental Surg. John D. Milliken, having reported his arrival at San Francisco, will proceed to Fort Leavenworth for duty, relieving Dental Surg. Ralph W. Waddell, who will proceed to San Francisco and take transport to sail from that place on or about February 15, 1906, for the Philippine Islands. (Jan. 17, W. D.)

BILLS BEFORE CONGRESS.

Sen. 2355—Mr. Pettus: To reorganize the corps of dental surgeons of the army. Provides for a corps of dental surgeons not to exceed in number actual requirements nor proportion of one to one thousand in regular army, all original appointments to be made to rank of first lieutenant. Appointees must be citizens, between twenty-two and thirty years of age, graduates of standard American dental colleges, of good moral character and professional repute, and shall pass physical and professional examination, which shall include tests of skill in dentistry. Dental surgeons attached to the Medical Department of the Army at time of passage of act may be eligible to appointment, three to rank of captain, and the others to rank of first lieutenant, on the recommendation of Surgeon-general, subject to examination.

Professional examination may be waived in case of dental surgeons whose efficiency reports and entrance examinations are satisfactory to the Surgeon-general; and time served as dental surgeons under the Act of Feb. 2, 1901, shall be reckoned in computing increased service pay. Pay, allowances, and promotion shall be governed by laws applicable to the Medical Corps; their right to command shall be limited to the members of the dental corps and such enlisted men as may be assigned to it; right to promotion shall be limited to the rank of captain after five, and major after ten years' service; number of majors shall not at any time exceed one-eighth nor the number of captains one-third the whole number in said dental corps. The Surgeon-general is to organize a board of three examiners to conduct the professional examination: two civilians whose qualifications are certified by the executive council of the National Dental Association; and the third from the contract dental surgeons. Annulment of contracts made with dental surgeons under the Act of Feb. 2, 1901, shall be so timed and ordered by the Surgeon-general that the whole number of contract and commissioned surgeons rendering service shall not at any time be reduced below thirty.

H. R. 11,021—Mr. Wiley: That to the Bureau of Medicine and Surgery of the Navy there shall be attached a corps of dental surgeons, not to exceed proportion of one to one thousand, and not to exceed thirty in all. Corps shall consist of three grades; assistant dental surgeon, passed assistant dental surgeon, and dental surgeon, to correspond to grades of medical corps of assistant surgeon, passed assistant surgeon, and surgeon, respectively. Not exceeding five promotions shall occur in either grade, except to fill vacancies, in any one calendar year. Original appointments shall be made to grade of assistant dental surgeon; appointees must be citizens, between twenty-one and thirty years of age, graduates of standard dental colleges, of good character and professional repute, and shall pass physical and professional examinations. There shall first be selected a dentist of evident fitness for conducting the examinations and organizing the others, who shall be appointed to the grade of dental surgeon; any appointment made may be revoked by the president when in his judgment the number exceeds the requirements of the service or when, within three years from his appointment, an appointee discloses inaptitude for the service.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING DECEMBER 1905.

December 5.

No. 806,300, to James Sorenson. Dental ligature applier.

No. 806,345, to John A. Johnson. Suction attachment for dental plates.

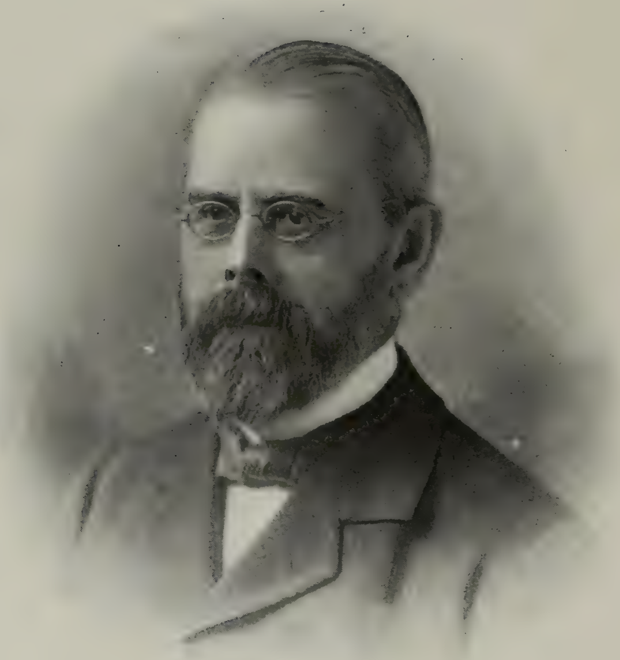
No. 806,694, to Victor Monath. Instrument for supplying constant currents of hot air.

December 19.

No. 807,905, to John C. Blair. Syringe.

December 26.

No. 808,105, to George W. Morse. Dentifrice.



H. M. Lewis

THE

DENTAL COSMOS.

VOL. XLVIII. MARCH 1906. No. 3.

ORIGINAL COMMUNICATIONS.

OBSTETRICAL DEFORMITY OF THE MANDIBLE.

By LANGDON S. CHILCOTT, D.D.S., Bangor, Me.

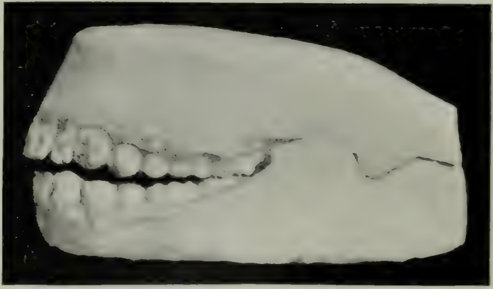
(Read before Section I of the National Dental Association, at Buffalo, July 25, 1905.)

IT is not my object in this brief paper to discuss methods for correcting the various irregular forms in which we find the teeth arranged in the human jaws, nor is it my purpose to criticize methods employed by members of the medical profession in the practice of obstetrics; but it is my hope in opening this subject that we may in time determine the cause of this deformity of the mandible, which I believe occurs at birth.

It is true there are no records, as far as I have been able to learn, to support this theory, nor do I know of anything having been written on this subject; but, in the absence of data, I believe we are justified in assuming that this marked and similar deformity of the mandible in a small percentage of patients must be due to some common cause. Those patients whose jaws are in the condition which I will try to describe are not, as a rule, aware that their mandibles are different in shape from those of their friends and acquaintances. They do not think it strange that only their posterior teeth articulate. They have often noticed an inconvenience in being unable to cause the lower incisors to reach the uppers.

When we examine the mouth we find a condition similar to that shown in Fig. 1, which was made from casts and articulation taken of the teeth of a young lady fourteen years ago, and which shows the characteristic articulation in this deformity. It will be seen that although

FIG. 1.



the patient in closing the mouth is able to bring together only the second molars of the maxilla and mandible, yet the teeth are all of normal size and have a natural position in the jaws.

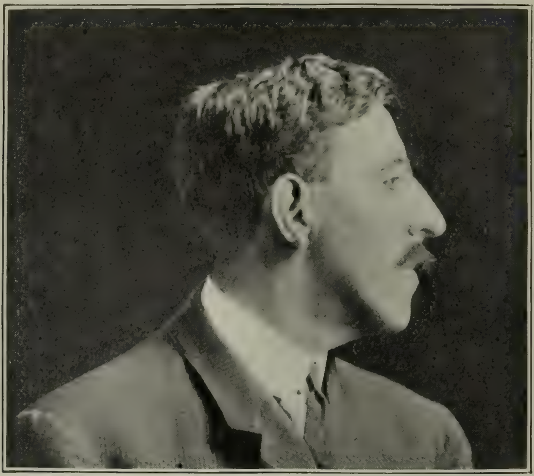
It is an *unnatural relation of the maxilla to the mandible,* and not the position of the teeth in the jaws, that established this condition; and it is caused by the straightening of the mandible at the angle. We may find associated with this condition any of the forms of irregularities, and the patient may, as a means of establishing the most satisfactory bite, acquire an unfortunate habit of protruding the chin, as explained by Drs. Baker and Howe of Boston.

But these features are entirely independent of the real issue. When we have the patient close the mouth, and we examine the side of the face, the absence of a pronounced mandibular angle is noticeable. Fig. 2 offers a good illustration of this feature, showing almost a straight line from the point of the chin to the middle of the ear. The chin is carried slightly forward. There is a marked thickness of the lower lip caused by an excessive muscular development induced by the effort to close the lips in articulation.

The history of this case shows that the patient as a child was slow in learning to talk, and that in his early boyhood days articulation was difficult with him. A figure showing the articulation of his teeth would have been shown had I not ground his posterior teeth to improve the bite before it occurred to me that the case might be of special interest.

This young man is a personal friend of mine, and it was a statement of his mother's that first caused me to think that this condition was caused by an injury to the mandible at birth during the last stage of labor.

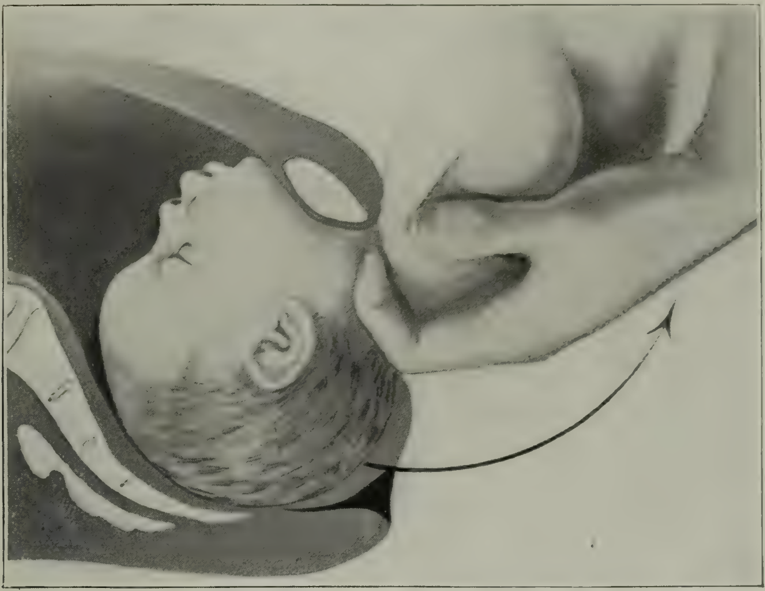
Fig. 2.



On reference to a text-book of Professor Williams, who occupies the chair of obstetrics in the medical school at Johns Hopkins University, we find it estimated by comparison of different authors that the uterus exerts a force in labor of from 16.73 to 577 lbs. Again from Professor Williams, quoting roughly, we find as to the frequency of the various presentations, based on several hundred thousand full-term cases, that 97 per cent. are of vertex presentation and 3 per cent. of breech presentation.

It is the birth of the head alone that concerns us here, and Fig. 3 shows the distortion which the head may undergo in a vertex presentation, due to the elasticity of the bones and unossified sutures. Mention is made of the change in shape of the cranial bones, but I find no reference in this connection to the mandible, which must suffer distortion and may not return to a normal shape.

Fig. 3.



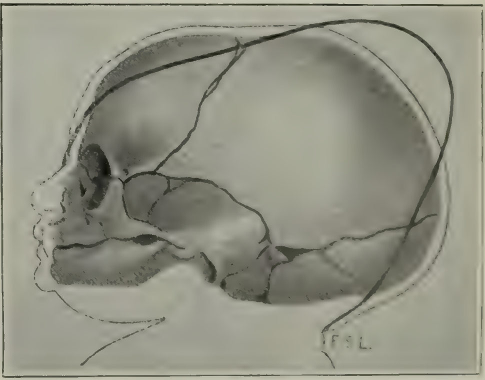
—*Williams.*

I wish now to call attention to a form of breech presentation, to illustrate how the mandible may suffer permanent injury. Professor Williams says that in the vast majority of cases the back of the child eventually rotates toward the front, no matter what its original position; but when it does not take place spontaneously the movement may be induced. When, however, this is impossible, delivery must be attempted with the head in the abnormal position by the employment of traction, as illustrated in Fig. 4. Two fingers of one hand grasp the shoulders while the other hand draws up the feet over the abdomen of the mother. As a result the occiput of the child is born first and the perineum is subjected to greater liability of rupture.

To more fully realize the danger of injury in breech presentation it must be understood that death to the child from asphyxiation is almost inevitable if the head be not delivered in less than eight minutes after the appearance of the umbilicus at the vulva.

Trusting the members of the association will study the history of all cases of this deformity which may come to their notice, and give their brother practitioners the benefit of their research, I leave the subject to your consideration.

Fig. 4.



—*Williams.*

THE X RAY IN DENTISTRY.

By **FRANCIS LE ROY SATTERLEE, Jr., A.M.,**
DIRECTOR OF X-RAY AND PHYSICAL LABORATORIES, NEW YORK COLLEGE OF DENTISTRY.

(Read before the First District Dental Society of the State of New York, March 14, 1905.)

I HAVE been asked to read a paper on the X rays, a subject by no means new to the dental practitioner, but always interesting in the extreme, possessing a fascination to the scientific worker, be he dentist, physician, surgeon, or physicist. The cloak of mystery that has been so long thrown around the X ray and all pertaining to it has been steadily shrinking in size under the systematic investigations, researches, publications, and discussions by men who, throughout the world, have devoted much time and thought to the solving of its problems. You will therefore pardon me, if in dealing with the subject this evening I repeat and rehash some of the facts that are by this time so well established in your mind.

It is nearly ten years ago that Wilhelm Conrad Roentgen made his first announcement of the discovery of the X rays before the Wurzburg Physico-Medical Society. In that time the technique and theories have undergone the same modifications and improvements that mark all investigative work in this epoch of scientific advancement. The algebraic unknown quantity *x*, that was so modestly bestowed upon this form of radiation by its discoverer, has now lost its significance, since we have not only become acquainted with its nature but have even classified it in its relationship with the spectra of light.

In a previous paper, published in the *Medical Record* of January 16, 1904, I presented a chart of the entire spectrum, indicating the respective positions and wave-lengths of all rays from the X rays to the Hertzian rays. This chart I here reproduce as a lantern-slide [exhibiting]. The description of it I will quote from my former article:

<table>
<tr><td></td><td></td><td>TRI-ULTRA-RED
or
HERTZIAN RAYS
wave length—some meters.</td><td></td><td></td></tr>
<tr><td></td><td></td><td>BI-ULTRA-RED RAYS
wave length—18 microns.</td><td></td><td></td></tr>
<tr><td rowspan="6"><i>Heat Rays.</i></td><td></td><td>ULTRA-RED RAYS
wave length—8 microns.</td><td></td><td></td></tr>
<tr><td rowspan="10"><i>Chemically Active Rays.</i></td><td>RED
wave length—0.71 micron.</td><td rowspan="7"><i>Optical Rays.</i></td><td></td></tr>
<tr><td>ORANGE
wave length—0.66 micron.</td><td></td></tr>
<tr><td>YELLOW
wave length—0.62 micron.</td><td></td></tr>
<tr><td>GREEN
wave length—0.53 micron.</td><td></td></tr>
<tr><td>BLUE
wave length—0.49 micron.</td><td rowspan="4"><i>Finsen Rays.</i></td></tr>
<tr><td></td><td>INDIGO
wave length—0.41 micron.</td></tr>
<tr><td></td><td>VIOLET
wave length—0.38 micron.</td></tr>
<tr><td></td><td>ULTRA-VIOLET
or
CATHODE RAYS
wave length—0.21 micron.</td><td></td></tr>
<tr><td></td><td>BI-ULTRA-VIOLET
wave length—0.1 micron.</td><td></td><td></td></tr>
<tr><td></td><td>TRI-ULTRA-VIOLET
or
RÖNTGEN RAYS
wave length—0.014 micron.</td><td></td><td></td></tr>
</table>

Note—One micron=one-millionth of a meter.

Starting at the very lower end of the spectrum, we have the Roentgen rays, or as I have called them, the "tri-ultra-violet rays," with an estimated wave-length of 0.014 micron. The next step I have called the "bi-ultra-violet" or Becquerel rays, consisting of the rays given off by such radio-active substances as radium, uranium salts, polonium, and the like, with a wave-length of 0.1 micron. Next we have the ultra-violet radiation known as the cathode rays of Weidemann, Crookes, and Lenard, of about 0.21 micron in length. Above this come the violet, indigo, blue, green, yellow, orange, and red rays, with their estimated respective wave-lengths, and still beyond these are ultra-red and as I choose to call them, the "bi-ultra" and "tri-ultra-red" rays. Between the last named and the bi-ultra-red division of the spectrum there exists a gap which is evidenced by the difference in the wave-length of the two rays. What occupies this gap we have been so far unable to discover. The tri-ultra-red rays consist of the electro-magnetic or Hertzian rays, now utilized for our wireless telegraphy.

Since the taking of the first radiograph in 1895 the time of exposure has been undergoing a continual shortening. I well remember the first X-ray picture I made of the human hand in twenty minutes' exposure; that was in 1897, with a static machine of old pattern. The same picture today takes me but a single second. This evolution is due to the vast difference between the apparatus of today and that of seven or eight years ago. The static machine was then almost universally used, while now we have discarded it for the powerful induction coil for all radiographic work. However, in justice to the makers of the static machines, I will say that they have produced new models that have far superseded the old machines, and that for fluoroscopic examinations of the body the static machine is still in the lead.

APPARATUS AND TECHNIQUE.

A complete outfit of the modern class for dental X-ray work is: An induction coil giving a six-inch or longer spark, with a removable primary, an electrolytic interrupter of the Weynelt type, a commutator or pole-changer, a suitable rheostat, a foot-switch, spark-gaps, ampere- and volt-meter, a fluoroscope about 5 x 7 inches in size, a tube-stand, and a supply of vacuum tubes as large as the purse of the operator will permit. This last requisite is of vast importance to the X-ray worker, since therein lies the secret of good radiography. The constant changing of the vacuum of the tube has been the greatest *bête noire* of all successful operators, and unless the degree of vacuum of the tube is of the required standard all his work has gone for naught. It is true we have X-ray tubes constructed along the most scientific lines with regenerative attachments by which we can lower the vacuum and also raise it. My personal experience with them, however, fixes in my mind a certain limitation to the value of such tubes, since it is so easy to lower them too much; and as for the raising attachments, I have found them to be a delusion and a snare. I have also found that the tubes that are made in this country cannot compare with those of German manufacture. It is, therefore, well to have a goodly stock of tubes to select from whenever an exposure is made.

The standard size of the dental negative is 1¼ x 1⅝ inches, which is as large as we can comfortably place in a patient's mouth; at times we find this too large and are obliged in such cases to cut the film still smaller. These films are then covered with black paper and a second coating of palate rubber. I generally use two colors, black and red. These I cut into oblong pieces a little larger than the covered film, and place the film on one of them and cover it with one of the other color, so that the sensitive side of the film lies toward the black rubber. After pressing the two rubbers together, which seals them and makes the film thoroughly moisture-proof inside, I trim away all surplus rubber. The film is then ready to be placed in the mouth, with the black side of the rubber toward the tube.

The film that I have found best adapted to the purpose is a cinematograph positive film made by the Eastman Kodak Co. These they have recently been putting up in black paper envelopes, two films in a package. All we have to do is to place these black envelopes in their rubber covering and proceed to work. The advantage of thus exposing two films at one time is sometimes very important, since, if any accident happens to one in the developing solution, we have another left to develop. Or we may use two different developers on them and get variations in density in the resulting negatives. Another good film is the triple-coated-process film made by the Seed Dry Plate Co. The disadvantages in these films are their thick celluloid backing, which resembles ground glass and gives to the negative a somewhat granular appearance, and the fact that they are triple-coated, which in their emulsion seems to be necessary to give sufficient contrast to the negative. In coating these films the sensitizing solution is flowed over them three times, allowing them to dry between each coating; consequently, while drying, small particles of dust adhere to the surface and are embedded in it by the next coating. This does not allow of very good lantern-slides being made from them, as the particles of dust are highly magnified and make many unsightly spots on the screen. This fact is well illustrated by spots on some of the slides shown, while those of the single-coated cinematograph films so recently placed on the market will appear quite unblemished. The technique of taking the radiograph is to place one of these films in the mouth so that the black side of the rubber comes in contact with the lingual surface of the teeth and is pressed into position so that it will conform to the curvature of the arch. The tube is placed so that the rays radiating from the anode will pass through the teeth and coverings of the film and leave its chemical impression on the sensitive coating. The tube should be about 12 to 24 inches from the face. Exposures vary from 1 to 20 seconds, depending on the character of the ray and the efficiency of the apparatus used. With a good coil and interrupter an exposure should not take longer than ten seconds if your tube be of the right degree of vacuum. In taking more than one thousand dental radiographs I have never had a case of dermatitis develop from the exposures. We may safely say that no X-ray burn can be developed in less than three minutes' exposure, even taking for granted that the patient has an idiosyncrasy toward dermatological inflammation.

DIAGNOSIS BY MEANS OF THE X RAY.

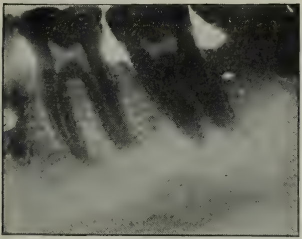
Among the diseases and abnormalities of the teeth and jaws where the radiograph has been of great assistance, and in many cases an actual necessity, to the dental practitioner, we may mention—

(1) Alveolar abscess and pericementitis.
(2) Necrosis.
(3) Defective fillings.
(4) Outlining and locating roots.
(5) Inspecting root-canals.
(6) Locating non-erupted and impacted teeth.
(7) Locating supernumerary teeth.
(8) Locating broken broaches and instruments.
(9) Locating foreign bodies in root-canals.
(10) Outlining the maxillary sinuses.
(11) Pyorrhea alveolaris.
(12) Fracture of the maxilla.
(13) Epulis.
(14) Tumors; and many other conditions too numerous to mention.

To correctly form an opinion or diagnosis of a pathological condition of the teeth and alveolar process by the radiograph, we must first appreciate the appearance under the X ray of the normal tissues involved. Let us therefore turn to a lantern-slide of a normal radiograph. (Fig. 1.) We have in the center of the picture the lower right first and second molars, with parts of the third molar and second bicuspid on either side. This picture, unlike a photograph, is not a reflected image of the teeth, but a shadowgraphic section of the entire structure from facial to lingual surface. The penetrating power of the rays varies inversely with the density through which they pass, consequently the lines in the picture and the shading from dark to light represent the structure in its exact gradations from dense tissue to comparatively soft tissue. Real soft or connective tissue is rarely if ever visible in the radiograph; it does not give even the faintest shadow, except where the portion is thick, as in the case of a low-vacuum tube, where the gingival margin is faintly discernible.

We have to judge soft tissues by the light areas which indicate their location. The picture before us demonstrates the relative densities of the several parts of a tooth, and the alveolar process, the pulp, the contents of the root-canals, and the alveolar dental membrane or periosteum, as follows: The filling in the crown of the first molar, the crowns of the teeth, the roots and apices of the roots. The fifth gradation of density is the interior of the alveolus, to which is applied the alveolar dental membrane; this represents the most recently developed portion of the alveolar wall. The next lightest shade is the lines running irregularly throughout the alveolar process, forming a network structure that characterizes the X-ray appearances of normal cancellous bone tissue.

Fig. 1.



Examining the first two molars, they resemble teeth that have been split in halves, with their pulp-canals exposed to full view. We can gage the relative thickness of the dentin and cementum wall, which separates the periosteum from the contents of the pulp-canals, neither of which are visible. In the second molar there appears at first sight to be a substance of some kind partially filling the pulp-chamber and extending down into the roots; but let us stop and consider. Images in radiographs are not confined to one plane, but consist of a series of planes of infinitesimal thickness or rather thinness. The density of the lingual and facial alveolar structure at the respective surfaces of the roots of this tooth so obstruct the X rays as to produce a screen-like shade which prevents our seeing the outlines of the canals in the roots of the tooth, and also the definition of the deeper outlines of the pulp-cavity.

The outlines of the tooth-socket have a white circumferential space surrounding the roots, which lodges the pericementum, alveolar dental membrane, or periosteum of the alveolus, which is not defined by the X ray, since, as I said, such tissue is incapable of definition.

The next important step, after differentiating between the several tissues that make up the dental radiograph, is to correctly get our bearings in regard to the teeth we are looking at, and their positions relative to the part of the mouth in which they are situated. To do this I will make use of a very simple but perhaps rather undignified simile, namely, to imagine that you are sitting comfortably ensconced upon the posterior part of the tongue, with your back resting against the uvula; the teeth are in perfect occlusion meanwhile. Now, on looking about you, the panorama of the teeth is unfolded—a view from the lingual aspect—and is identical with the appearance of the teeth on the printed radiograph or the positive lantern-slide. Keeping this fantastic imagination in your mind, you will have no difficulty in establishing a proper relationship between the radiographic outlines of the teeth and their actual position in the mouth. There is one point, however, that we did not take into consideration in the simile, and that is the fact that the X ray not only looks farther than the lingual surface, but penetrates toward the facial surface.

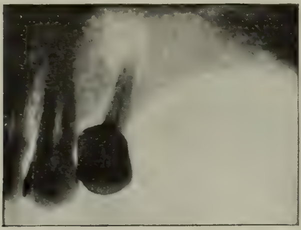
We have now advanced step by step along the lines of study of the normal radiograph and its geography. Let us therefore turn from the normal to the pathological pictures, and in the same way analyze their shadows and draw our deductions—which we dignify by the term "diagnoses."

PATHOLOGICAL CONDITIONS: ALVEOLAR ABSCESS.

Our first case will be that of an alveolar abscess. The inflammation and destruction of the cancellous bone structure, consequent to an alveolar abscess, may spread and cause the death of adjacent teeth, or may break through the alveolar wall at some point, or may involve the maxillary sinus. These changes will be indicated by the radiograph, since most of them will involve a change of density of the parts, which in turn will throw its shadow of relative density upon the film. Thus we see the white area around the root, showing us the extent of destruction and the approximate size of a cavity resulting therefrom.

Let us examine the picture before us. (Fig. 2.) We see at a glance that the teeth, from left to right, as you are looking at them, are the lateral, canine, and first bicuspid. Knowing this, and using the simile spoken of before, we see that they must be on the right side of the upper arch. The first bicuspid appears to have a very dark crown, too opaque for normal tooth-structure—so we say it is a gold cap. We observe in connection with it that the fit is not that of a London tailor. We next notice a black line running part-way up the canal, indicating density. We therefore deduce that the canal has been partly filled, but not completely to the apex, thus giving rise to the abscess cavity, which is shown by a white area around the apex, indicating complete lack of density, or space.

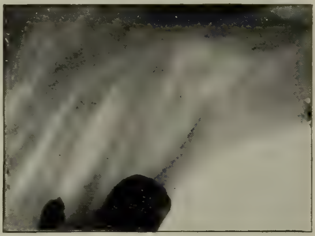
Fig. 2.



There are several points of interest in this picture, which we may briefly enumerate as follows: The abscess cavity, or destruction of cancellous bone tissue, and its cause, which is evident from the canal filling; secondly, we see the misfit of the crown itself; thirdly, the sharp line of demarkation between the white area and the surrounding alveolar process. The fourth feature of interest is the rise in the border of the alveolar process due to absorption consequent to extraction of the teeth posterior to the first bicuspid; and lastly, the lighter shading of the process around the abscess cavity, which might indicate changes in density of the tissue due to inflammation, or the fluorescent and radioactivity of the pus itself, which has infiltrated the process to some extent.

The patient, Mr. D., presented himself on the 23d day of last May at the laboratory of the New York College of Dentistry for a radiograph. He said that his first bicuspid had been recently crowned, and that he had had the root filled. He was suffering much pain, and an abscess was of course suspected. The radiograph, as you have seen, verified the diagnosis and has told us a great deal about the case which we could not have discovered by any other means. Eight months later he presented with a more cheerful countenance for a second picture to see what treatment and nature had done for him in the meanwhile. This is shown by the next picture, which shows the same tooth, but the film had been placed at a slightly different angle in the mouth. (Fig. 3.) We will therefore rotate it to the same angle as the first and throw them both on the screen together for comparison. Let us take the same five points of interest in the first picture (Fig. 2) and see the changes that have taken place. (Fig. 3.) The root-canal filling extends in Fig. 2 only about half-way up. In Fig. 3 we observe that the filling still does not reach to the apex, and there is a rigidly straight line present which suggests the possibility of a broken broach, which the patient himself

Fig. 3.



had reason to believe. He was a young, embryonic dentist, and had watched the operation upon his mouth with care. It is evident, therefore, that the patient has had the filling removed, and, we presume, the cavity drained, and partially refilled. We also observe that a new crown has been made which fits the tooth much more closely and more regularly.

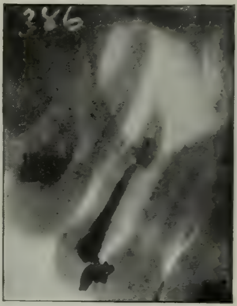
We now come to the chief point of interest in the second radiograph (Fig. 3), namely, the disappearance of the sharp line of demarkation between the white area and its surrounding process, the decrease in size of the area itself, and a decidedly darker shade of density in the center of the area as it now appears. This can indicate but one thing. The cavity is *gradually filling up* with some structure that possesses density for the ray. This cannot be merely granulation tissue, but from the characteristic appearance we might say that it is *real cancellous bone structure,* or *alveolar process.* The fourth point of interest in Fig. 2 was the absorption of the process back of the first bicuspid. In Fig. 3 we see that the rise in the alveolar border is greater, indicating that in the eight months intervening between taking the two radiographs the absorption has gone on to a greater extent. Lastly we note that the lighter shading of parts of the process in Fig. 2 has also disappeared—due, we will say, to the absence of present inflammation or pus.

To briefly recapitulate the case: We present before you two radiographs of an abscess, the first taken while the abscess was active, showing the extent of depredation and its cause, and the second taken later to show the condition after proper treatment. I have dwelt at some length on this one case—longer than time will allow me to do on those to follow, but I have done so with an intent to show you just what the dentist can do with the X ray with proper methods of studying the radiographs. This is not an exceptional case, but highly typical in character, and by a series of X-ray pictures of his patients the practitioner can do all this and a great deal more with many of his own cases.

We will now rather briefly examine a few more cases of alveolar abscess, and I wish to show a miscellaneous collection of radiographs that I am sure will be of interest to you. In the subsequent pictures I will therefore first enumerate the teeth from left to right as you look at them, and then speak of the chief features of interest in each case.

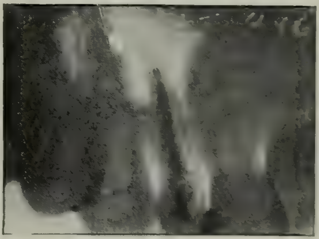
The next picture (Fig. 4) represents the upper left third, second, and first molars, and the second and first bicuspids, the canine, and part of the lateral. We observe around the apex of the first bicuspid a large abscessed area, as indicated by the lack of density. The filling extends only part of the way into the canal, with a gap and another small piece of filling material above, still leaving considerable space at the apex. The etiology of the case is therefore apparent. The patient was suffering pain at the time of the picture.

Fig. 4.



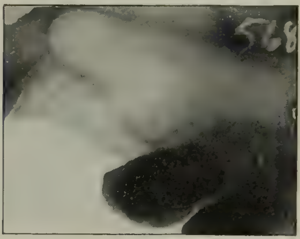
A second radiograph was taken of the same patient three months later, after the cavity had been drained and the root refilled. (Fig. 5.) This is well shown in

Fig. 5.



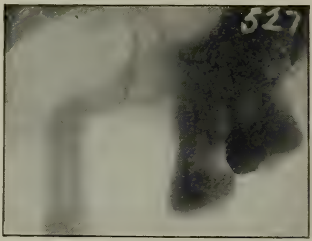
the picture before you. Note the extent to which the filling has now reached, and also the purer white of the cavity, indicating perhaps the absence of pus. Slight deposits of the earthy salts are probably being formed around the outer edge of the abscess cavity, judging from a slight increase of density over the first picture. A series of pictures of this patient, were it possible to obtain them, would show very well the course of repair, step by step, till we have the cavity entirely filled in. From these pictures alone it is impossible to tell whether the adjacent teeth are involved, as they appear to extend into the cavity, since the X ray does not confine itself to one plane only, but gives a series of planes from lingual to facial aspect. The abscess, therefore, may point anterior or posterior to the adjacent teeth as we look at them in the picture. This has always been a thorn in the side of the progressive X-ray operator, and many faulty diagnoses may have been based on this element of error. Stereoscopic dental radiographs are the only means to eliminate this uncertainty, and we at last may say that stereo-dental radiography is an established fact. However, we will speak further on this subject later, when dealing with the author's stereoscopic pictures.

Fig. 6.



Our next illustration (Fig. 6) shows part of the upper right first bicuspid and the second and third molars. There is an abscess area extending from the first bicuspid posteriorly along the floor of the antrum. The posterior termination of the cavity is not shown in the picture. A filling is shown which the history tells us is gutta-percha and of recent insertion. The abscess had been previously drained, and repair is very marked by the shade of density within the cavity. A point of interest is the dense line outlining the extent of the abscess. In the radiograph this line does not appear till after repair has taken place to some extent and remains afterward even when the space has filled in with bone tissue. The exact nature of this line is not fully understood, but it looks as though nature in her effort of repair throws out an extra deposition of calcium salts at this point, which has density for the ray, in order to prevent and limit the extent of the absorption.

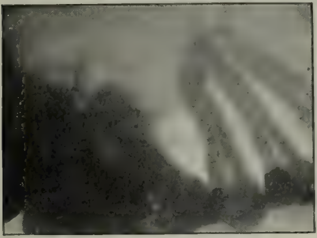
Fig. 7.



Our next picture (Fig. 7) is the upper right second bicuspid, and second and third molars. There are two small dark spots on the slide which should not be taken for abnormalities, since they are bubbles in the glass that the lantern-slide is printed on. They are to the left of the apex of the bicuspid. Here we have three distinct abscesses of different periods. That to the right is fourteen years old, and is entirely filled with bone tissue, but still shows, and always will, the line of demarcation just referred to surrounding the old cavity. It originated from the distal root of the first molar. The next abscess area, just to the left, is twelve years old, and originated from the mesial root of the same molar. It was consequent to this abscess that the tooth was extracted. The third abscess, which appears to be directly over the second bicuspid, came from the first bicuspid, which has also been extracted. The second bicuspid is alive and entirely sound.

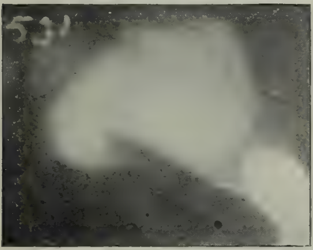
This radiograph (Fig. 8) is of the upper left third, second, and first molars, the second and first bicuspids, and the canine. We have here an abscess cavity in which repair has been going on for some time. It originated from the second molar. We also have a secondary abscess of more recent date over the first molar. This, however, is confined to a small area. Another feature of interest is the curve at the apex of the root of the second bicuspid.

Fig. 8.



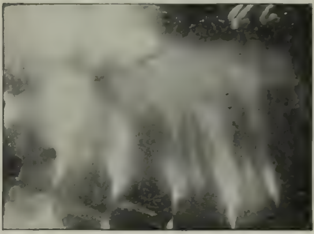
The next picture (Fig. 9) is one taken with a very low vacuum tube, in which all dense tissue is very black. The teeth are the upper left molars and second bicuspid. The first bicuspid has been extracted and the edge of the cavity is visible to the right. This is a radiograph of peculiar interest, inasmuch as the vacuum was so low as to depict the soft granulation tissue forming in the abscess cavity over the socket of the first bicuspid. You will observe that the density is greatest at the outer edge and decreases toward the center, thus showing that granulation takes place from the border of a cavity and gradually fills in toward the center. We may presume that osseous tissue supersedes the granulation tissue in the same order of formation.

Fig. 9.



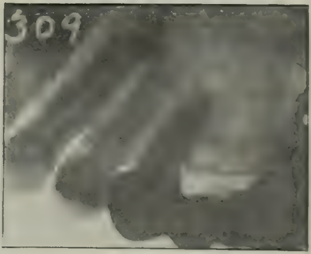
The next picture (Fig. 10) is another case of three abscesses. The teeth are the upper left first molar, second and first bicuspids, canine, lateral, and central. The history of this case is not accessible, so the exact cause of these cavities cannot be given, but it is evident by the several stages of repair or density that they were of different ages.

Fig. 10.



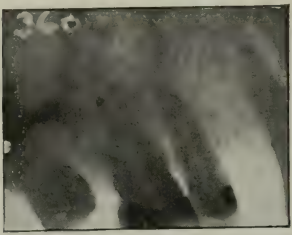
The next case is of the upper right lateral, canine, first and second bicuspids, and second molar. (Fig 11.) Here we see a large abscess cavity, originating from the extracted first molar. Repair is progressing favorably and is well advanced in bone tissue. The bridge extending from the second bicuspid to the second molar is evident, as well as the porcelain dummy that takes the place of the first molar. The filling in the root of the second bicuspid shows very well and extends nearly to the apex. I will call your attention also to the gingival filling in the canine.

Fig. 11.



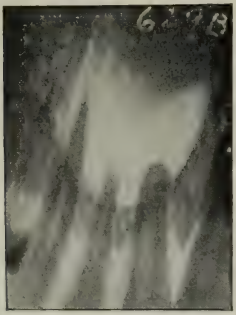
Our next illustration (Fig. 12) shows the upper left third and first molars, second bicuspid, and canine. We have two abscess cavities. The one to the left is eighteen years old, while that to the right is fifteen. As you see, they have both become solid alveolar process, although the old line of demarkation is still apparent, which outlines the extent of the old depredation.

Fig. 12.



The next picture (Fig. 13) shows the following teeth: the edge of the upper left first bicuspid, the canine, lateral, central, and edge of the right central. This radiograph is peculiarly interesting, since it combines two pathological conditions closely related to each other, namely, an alveolar abscess from the left central extending posteriorly, with the extreme palatal border decidedly necrosed. This necrosis is shown by the absence of a sharp line dividing it from the healthy tissue, as is seen at the lower border, and as is also seen in all the previous cases of abscess. Instead, the white area gradually and unevenly shades off into the dense and healthy bone surrounding it. In a case like this, where an alveolar abscess has had the wall of its cavity broken down by necrosis, this gradual shading is always characteristic, and it is hard to tell just where the healthy tissues begin. Another point of interest in this case is the slightly absorbed portion of the root of the left central and the unusual size of the pulp-canal.

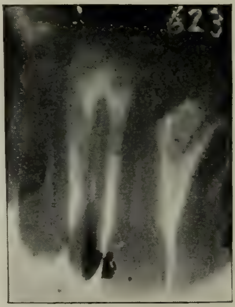
Fig. 13.



Again, it is not positively evident from the picture alone that the trouble originated from the central tooth, as both the lateral and the canine are apparently involved in the abscess. The position, therefore, relative to the anterior or posterior (more correctly speaking, the lingual or facial) surfaces of these teeth can only be guessed at without recourse to stereoscopic radiography, which would settle this point beyond all doubt.

Let us now turn our attention to other cases of necrosis. In this radiograph (Fig. 14) of the upper left first bicuspid, canine, lateral, and both centrals, we see a considerable amount of necrosed tissue around the apex of the lateral, also some between the two centrals, and traces away up to the extreme upper left side of the picture. This, again, characterizes the shading from light to dark, or disintegrated tissue separated from the normal alveolar process.

Fig. 14.



The next picture (Fig. 15) indicates a part of the right upper arch with necrosis in a patient of syphilitic tendencies. Here the white areas are found over the roots of the first bicuspid and an old absorbed root of the first molar. On the other side of the same mouth we see a similar condition, although not quite so well marked. (Fig 16.)

FIG. 15.

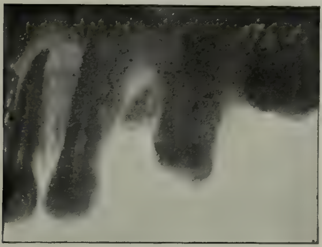
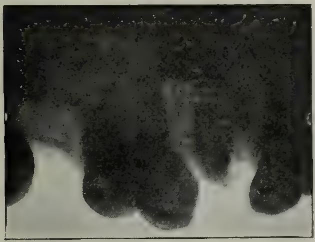
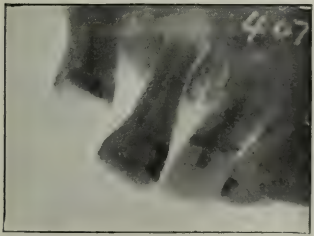


FIG. 16.



Our next illustration (Fig. 17) shows the root of the left canine, the space originally occupied by the left lateral incisor, the left central incisor, the root of the right central incisor bearing a dummy crown, the right lateral incisor, and the edge of the right canine. Here the necrosis is well marked, accompanied by absorption of the root of the left central. We also notice the pivot that holds the porcelain dummy to the right central root. The crown of the left canine is shown pretty well worn down.

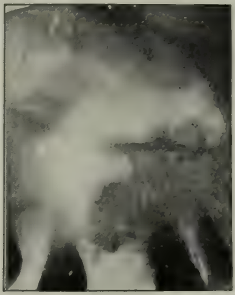
FIG. 17.



EMPYEMA OF THE ANTRUM.

Coming now to another branch of our subject we see a case of empyema of the antrum. (Fig. 18.) The teeth represented are: Edge of the upper left first molar, second bicuspid, canine, and lateral. Almost the entire left maxillary sinus is included—rather a rare achievement for the dental X-ray specialist. There is a fistula in the floor of the antrum connecting with a sinus running down through the process along the root of the second bicuspid, discharging pus into the mouth. This condition is of some standing and gives a fair idea of the extent of damage in a case of this character. The etiology was an abscess starting at the apex of this second bicuspid extending or pointing toward the antrum, through which it finally broke. This relieved the pressure in the anterior part of the abscess cavity and repair commenced, as indicated by the darker shading. You will probably observe that the antrum extends very far forward, in fact to a point over the apex of the lateral incisor. This is due to the ravages of the pus and consequent necrosis that has extended the antrum away beyond its normal boundaries. This was perhaps due, in some measure, to the fact that the patient, a young lady of about twenty-eight years, during the night, lay with the left side of her face toward the pillow and consequently gravitation brought a collection of pus at the anterior portion of the maxillary sinus, thus causing the necrosis at that point.

FIG. 18.

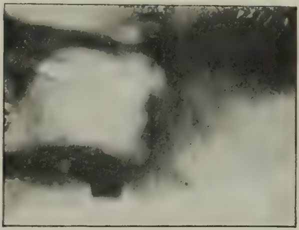


Another smaller abscess is to be seen to the extreme right, at the end of the enlarged antrum. This originates from the apex of the left central, and cannot be seen in the accompanying picture. It has, however, taken the path of least resistance and pointed straight for the antrum, where it has probably broken through at the point previously indicated.

Before leaving this radiograph I would like to call attention to the absorption at the end of the bicuspid root. There is also a considerable amount of necrosis and probably radio-active infiltration posterior to the sinus at the apex of this root. The normal alveolar process is beautifully shown in this picture, with its characteristic appearance around the roots of the lateral and canine.

The next case (Fig. 19) at first glance resembles as much as anything an uncompleted entrance to the subway, but on closer inspection we see what looks to be a piece of root in the lower left-hand portion of the picture. A root it is, and the key to the whole situation. The patient was an old lady who had lost all the teeth in the upper arch and was wearing a full plate. About a year after wearing the plate it began to be uncomfortable at one point, the trouble increasing week by week, till at last the wearing of the plate became unbearable. Since the gum had cicatrized completely over the entire arch it was not very easy—particularly when the patient could not exactly point out the source of pain herself—to locate the seat of the trouble. She was accordingly sent to me for a radiograph. As you see, this crooked root was located, with a slight abscess sac at the apex of the root. This had given rise to all the trouble, for, as the absorption gradually took place subsequent to the extraction, the root became more and more uncovered, till at length it pressed directly into the gum tissue, causing soreness and pain every time she used the plate.

FIG. 19.

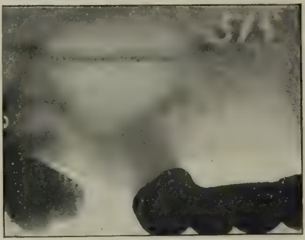


The reason for leaving this root in the mouth is apparent when we observe the curved apex.

Now, above this root we find a large abscess cavity in which repair is very slowly going on. This cavity had undoubtedly connected with the antrum, since we see it extending along the floor with some necrosis inside. Furthermore, the patient gave a history of a nasal discharge about a year ago. The absorption toward the anterior part of the mouth is well shown, also the black border of the alveolar ridge at a point just to the left of the curved root.

The next picture (Fig. 20) shows us the second molar, the second bicuspid, and a bridge. Over the bicuspid we see an abscess area well filled up with bone tissue. This cavity originally connected with the antrum, along the floor of which it borders. At a point between the two teeth was a sinus that for some time past discharged pus into the mouth. A radiograph was desired to show the source of this flow of pus. The picture before you was taken, but no actual pus was indicated. However, at first it was thought that pus must come from the old abscess cavity, even though repair had set in. Consequently the patient's dentist, Dr. A. M. Birkhahn, drilled through the

FIG. 20.



crown, only to discover a live tooth. We were for the time being "up a tree," till another picture was taken which made matters as clear as daylight. (Fig. 21.) In this picture I placed the film farther back in the mouth, taking in the region of the unerupted third molar. What was the result? We see this missing tooth calmly reposing upon the unoffending roots of its neighbor, thereby producing inflammation and pus that trickled down through the sinus in the process that opened into the socket of the first molar, as shown in the radiograph. You will also note two facts in regard to this case: first, the position of the third molar at right angles to the axis of generation; secondly, absorption of the root of the second molar. Dr. Birkhahn removed the second molar, and the flow of pus immediately ceased, since the irritation was removed.

Fig. 21.

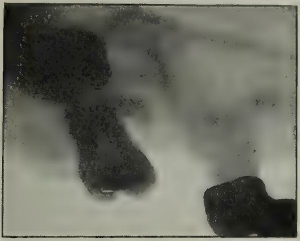
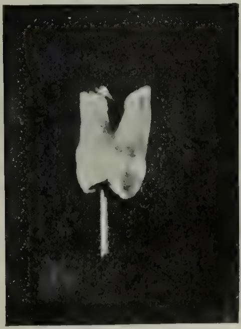


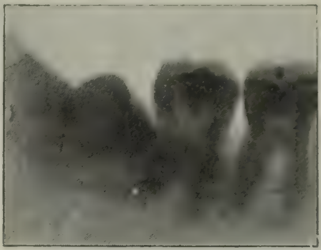
Fig. 22.



I show herewith a lantern-slide (Fig. 22) from a photograph I made of the extracted tooth, showing very well the absorbed roots.

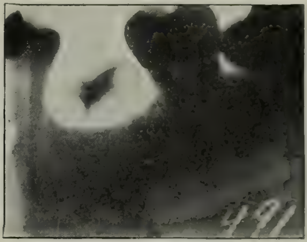
The next picture (Fig. 23) shows an impacted lower third molar. This is, of course, a rather frequent abnormality and needs but little description.

Fig. 23.



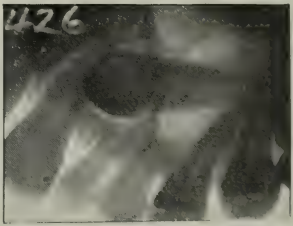
The next picture (Fig. 24) is also an impacted lower third molar, but on the right side and in another patient. Here also we may observe a piece of broken alveolar process, at the socket of the first molar, that is only held in place by the gums.

Fig. 24.



Our next radiograph (Fig. 25) is that of an impacted upper right canine, showing beneath it the two deciduous teeth, the lateral and canine, with absorbed roots. The permanent bicuspids are both in place.

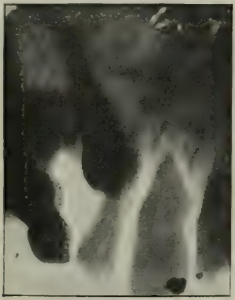
Fig. 25.



The next illustration (Fig. 26) is that

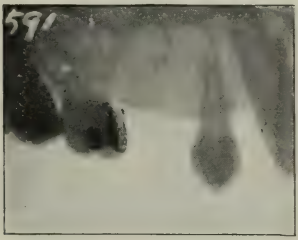
of an impacted upper left canine of still another patient. Beneath it we have, I think, its deciduous namesake. At the left of the picture we see some bridge work, and we also observe a small abscess over the root of the tooth next to the deciduous one. I did not get a complete history of this case on paper and so have to trust to memory, but, as I recollect, the tooth with the abscess was a lateral.

Fig. 26.



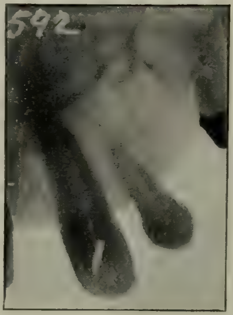
The next picture (Fig. 27) is from a girl twelve years old, who gave a history of no permanent bicuspids. The teeth, beginning at the right, are the second and first molars, deciduous canine and central, on the upper left arch. We see at the very top of the picture the floor of the antrum, and just below it the buds or germs of the bicuspids, which resemble as much as anything two well-filled-in abscess areas. These, however, are the developing teeth.

Fig. 27.



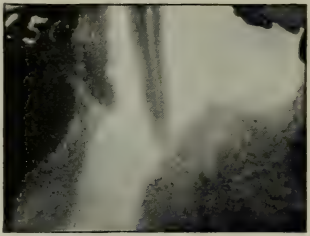
On the right side of the same mouth we see practically the same state of affairs. (Fig 28.) Again we see the deciduous canine next to the central, with the edge of the first molar showing at the extreme right. Above the gap existing between the last-named tooth and the deciduous canine, and in direct line with the floor of the antrum, we see again two germs of the bicuspids undeveloped. These, of course, may in time erupt, but it will be a long wait, if indeed they ever become developed enough to come down into place.

Fig. 28.



The next picture (Fig. 29) represents a fracture of the mandible at the point of the canine. This needs no explanation, as the break in the process is very obvious. The patient, a policeman, who had been struck with a baseball bat in an attempt to raid a Sunday ball game, reported to the infirmary of the college for treatment, when after the taking of the picture the canine was extracted, and by means of wire the two portions of the jaw were brought together, and union at once started. I took another picture shortly after the wiring, which shows how the two portions of bone were brought into apposition. (Fig. 30.)

Fig. 29.



The next case is somewhat rare, namely, fracture of the superior maxilla. The patient, a fireman, while attending a fire fell from a ladder upon a picket fence. One of the pickets entered on the right side just above the hyoid bone, passed through the floor of the mouth along the right ramus of the jaw, made an incised wound on the right side of the tongue, and emerged at the naso-labial junction, passing through the upper jaw at a point in the median line, and breaking a wedge-shaped fragment from the palatal process of the right side. He had an uninterrupted convalescence at Roosevelt Hospital, and was referred to the college infirmary for treatment of the fracture. The radiograph (Fig. 31) shows the fracture from the median line down to a point between the two bicuspids. Another picture, the film of which was accidentally destroyed, so that I am unable to show a lantern-slide of it, outlined the fracture at the median line.

FIG. 30.

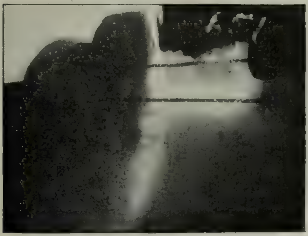
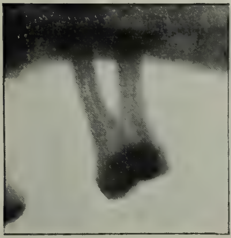


FIG. 32.



Our next illustration (Fig. 32) shows the absorption that has taken place incidental to old age.

PYORRHEA ALVEOLARIS.

The next radiograph I will show is a typical case of pyorrhea alveolaris. (Fig. 33.) The teeth represented are the four lower incisors, with the canine and part of the left first bicuspid, and a piece of bridge work on the right side. This patient had some flow of pus and the four incisors were very loose. You will note the small amount of process holding these teeth in place. This case was treated with the X rays and bi-ultraviolet rays, combined with high-frequency currents, with excellent results. I will refer to the case later in talking of the therapeutic use of the ray, so I would therefore advise a careful examination of it.

FIG. 31.

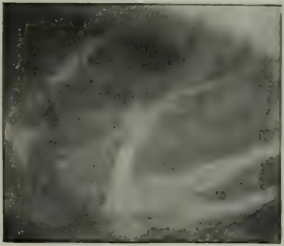
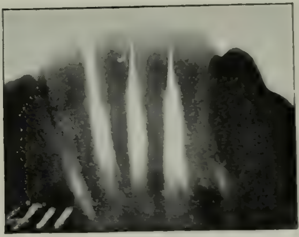


FIG. 33.



STEREOSCOPIC PICTURES OF THE TEETH.

We will now take up an entirely new branch of dental radiography, namely, the taking of stereoscopic pictures of the teeth. The desirability of such pictures has long been in my mind, but the actual taking of them I have but very recently accomplished. Stereoscopic X-ray pictures of the body have been made for some time, but the teeth offered greater obstacles to the X-ray specialist. To correctly take a stereoscopic picture of any kind, two pictures of the object must be made from viewpoints having the distance between them equal to the average distance of the centers of the two eyes from each other. This is approximately 2½ inches. The resulting pictures are then developed and printed, and are viewed through the instrument we call the stereoscope.

In taking these pictures, therefore, of the teeth, I have found that a film placed in the mouth and replaced in the identical position by a second plate, and two exposures given—moving the tube exactly 2½ inches to one side between exposures—will give excellent results. The difficulty is two-fold, however: first, the duplicating of the position in placing the second film in the mouth; and secondly, the moving of the tube just 2½ inches and at the same time preserving the same relative position in other planes.

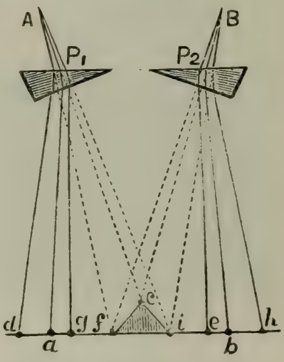
It is too soon, therefore, to announce any regular technique for the taking of these pictures, although I am working on a method and devising special apparatus that I think will simplify the operation to a great extent.

The principle of the stereoscope I suppose is familiar to you all, but for the benefit of any of you who are rusty in your physics I will project on the screen a lantern-slide of a diagram explaining the optical principles involved.

Weinhold makes these principles very clear in the following explanation: Referring to the diagram (Fig. 34) we let the left eye be at A, and the right at B. Let *a* and *b* be the corresponding pictures for each eye, and P_1 and P_2 two prisms of glass, through which they are seen. A prism refracts rays of light so that objects viewed through it appear to be nearer to the refracting edge; the prism P_1, therefore, refracts the ray $a\ P_1$ in the direction P_1A, as if it proceeded from *c*. The prism P_2 refracts the ray $b\ P_2$, so that to the eye at B it also appears to proceed from *c*. The effect of this is that the object really appears to be at *c*. And as the points *a* and *b* combine to form the point *c*, so *d* and *e* unite to form the point *f*, and *g* and *h* to form the point *i*.

The possibilities of these pictures will speak for themselves when you examine the specimens I will show you tonight. I pass around three stereoscopes with different radiographs in them. They are the first, to my knowledge, that have ever been reproduced from the living subject.

FIG. 34.



If you will place these instruments close to your eyes and hold them so that you get a good light on the pictures, you will see them stand out as if you were looking at the actual teeth in the alveolar process, instead of flat reproductions that give no idea of depth to the eye.

Should the focus not be right for your eyes, you can adjust it by moving the cross-piece that holds the pictures either nearer to or farther from the eye by sliding it along the projecting strip of wood.

THERAPEUTIC USE OF THE X RAYS.

I now come to the last branch of my subject: the therapeutic use of the X ray in dentistry. Its value has been fully proved by many clinical tests throughout the country. Having personally given it long and patient trials, I must say that I have had, on the whole, very good success with it in certain forms of pyorrhea alveolaris and facial neuralgia. Its analgesic effect is marked, as well as a subtle power toward the elimination of pus. I have derived the best results from a combination treatment of the X ray and the use of special vacuum electrodes of my own design that convey the high-frequency currents and at the same time bathe the gums and underlying tissues in the rich radiations of the bi-ultra-violet rays. A metal electrode is meanwhile held in the hand to complete the circuit through the body of the D'Arsonval currents.

Time will not permit me tonight to speak of the many good results of this treatment and I will confine myself to a description of but one typical case, the one of which you saw the slide a little while ago. This patient had a series of five or six treatments of about three minutes each, X ray and bi-ultra-violet. At the end of this time all pus had ceased and the soreness had completely disappeared. After a somewhat protracted series of treatments the patient was so much benefited that the teeth were held much more firmly in the mouth; in fact, all but one were absolutely tight. That one, the left central, did not have process enough to hold it firm. The patient had a band placed around this tooth, anchoring it to the adjacent ones and thus giving him as serviceable a set of teeth as ever before. Without this treatment he certainly would have lost all four teeth, if not more. Since I stopped the sittings of this patient (now almost a year ago) he has had no return of pus, but has had occasional soreness. This is removed by a single treatment of the X ray alone for three minutes.

CONCLUSION.

I have now covered as completely as I could the entire subject of the X ray in dentistry, and I hope have not taken up too much of your valuable time. Should I have used phraseology that is not in accord with your technical ears, I trust you will overlook it, and consider that I am neither a dentist nor a physician, but have treated the matter as far as possible from the standpoint of a physicist and general X-ray specialist.

Before closing I will call your attention to one more lantern-slide, showing the special tubes I designed and use for this treatment [exhibiting]. No. 5 is the handle into which we place the electrodes shown below. No. 1 is a crutch-shaped vacuum electrode, the curvature of which is placed against the gums, either over or under the teeth to be treated with the bi-ultra-violet rays and high-frequency currents. No. 2 is very similar, but is designed to cover a smaller area. No. 3 is for a single tooth. No. 4 is for the lingual application of a single tooth. Since taking this photograph I have added several more for the lingual application and for use on the posterior teeth.

I thank you one and all for your courtesy to me this evening.

A CASE OF FACIAL RESTORATION.

By Dr. ALEX. MERTENS, The Hague, Holland.

MR VAN E., age twenty-six, suffering from lupus since his fifteenth year, was successfully treated once a week by the Finsen method during one year. Being cured in August 1905 his appearance was as shown in Figs. 1 and 2. About this time the patient was sent to me by Dr. Schoemaker, and I undertook to construct a prosthetic apparatus to replace the parts lost.

An upper metal plate was made, bearing the four incisor teeth, with clasps around the canines and second molars. In the median line a perpendicular post of iridio-platinum wire was soldered to the plate, around which fitted a spiral spring such as formerly used to keep artificial dentures in place. (Fig. 3.)

The next step was to take a plaster impression of the face, from which a plaster cast was made. Upon this cast was modeled in wax a nose and upper lip in harmony with the remaining features of the face. This wax model was tried on and the necessary alterations made. The corners of the artificial lip embraced the remaining stumps of the natural lip.

A hook was attached to the inside of the artificial nose, which grasped the top of the spiral spring. By this means the spiral spring is bent a little forward, thereby giving it a slight backward ten-

Fig. 1.

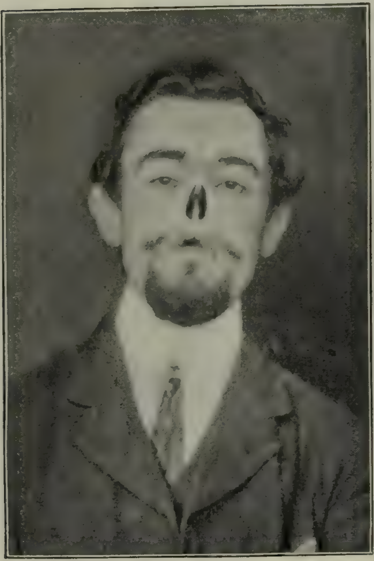


Fig. 2.

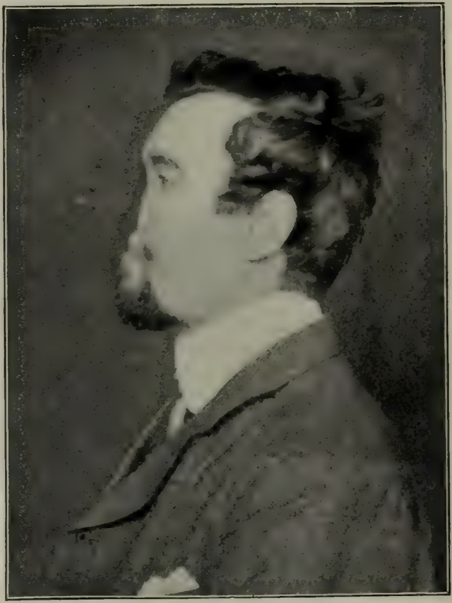


Fig. 3.

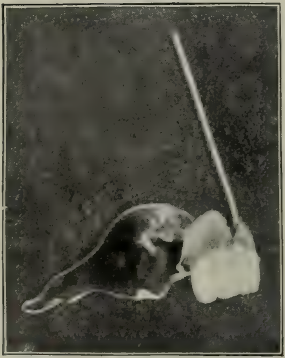


Fig. 4.

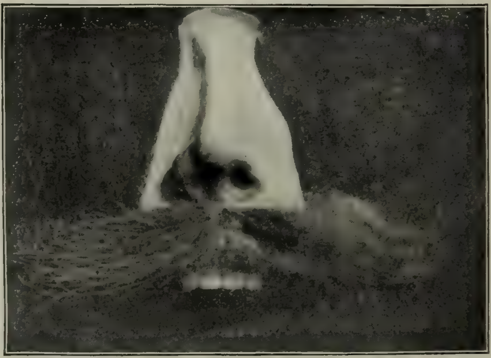


FIG. 5.

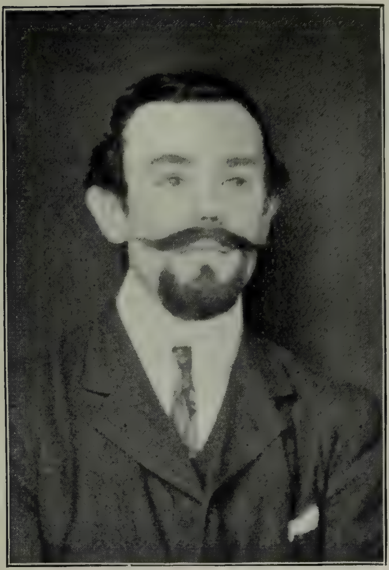


FIG. 6.

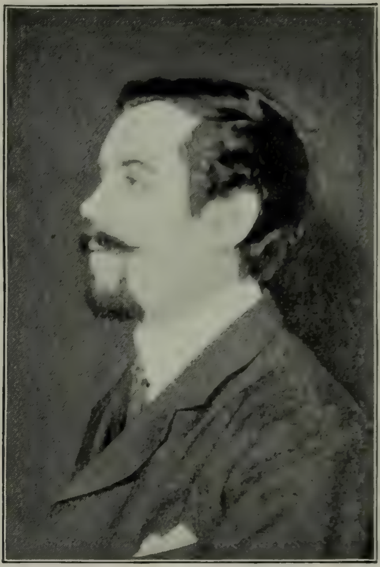


FIG. 7.

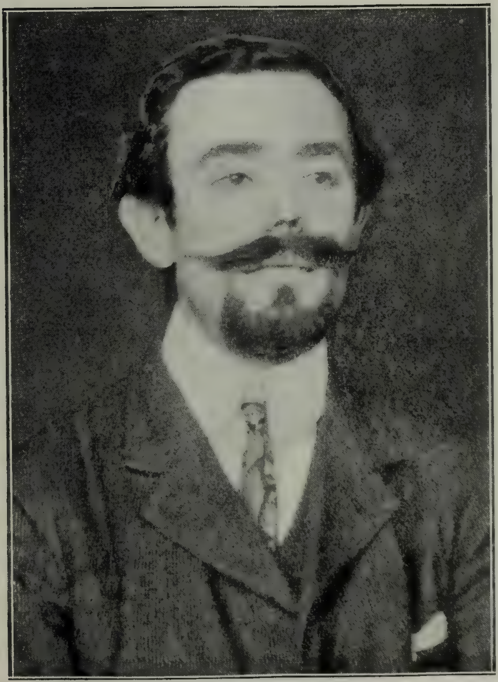
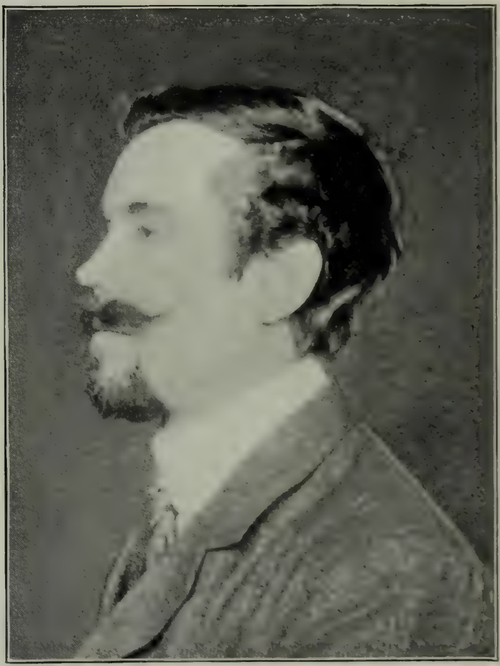


FIG. 8.



sion to secure a close fit of the edges of the apparatus to the face. Great care has been taken in avoiding dead spaces between the teeth and the lip, and the inner side of the nose is shaped in such a way that the moisture due to the condensation of the breath flows backward.

Everything being so far ready, the apparatus was reproduced in vulcanized rubber, the nose in hard rubber, and the lips in soft rubber. A strip of gauze, about $\frac{1}{3}$ of an inch in width, was fixed along the edge of the nose, and molten sticky diachylon painted over the back of this. Now the apparatus was put on and painted to accurately match the color of the face. The last thing was to fix an artificial mustache on the lip. Fig. 4 shows the different parts put together.

Figs. 5 and 6, and Figs. 7 and 8, which are reproductions from photographs, taken respectively from a distance of three and of two yards, clearly show the happy results obtained.

The whole apparatus is so simple that the patient can take off the artificial parts and replace them again in a few seconds even without the aid of a looking-glass. First the denture with spiral spring is inserted; by a little hook, something like a button-hook, the spiral spring is bent forward, the little hook on the inside of the nose is hooked into the spring, and the stumps of the natural lip into the pockets in the artificial lip. The gauze strip is pressed down, and firmly sticks to the skin by the diachylon, and everything is ready. As will easily be understood, no part whatever comes in contact with the mucus of the nose, which is a great advantage in appliances of this sort.

The patient has been wearing this apparatus for some months with the greatest comfort and satisfaction.

ORTHODONTIA.

By V. H. JACKSON, D.D.S., M.D., New York, N. Y.

(Read before Section I of the National Dental Association, Buffalo, July 25, 1905.)

IN the study and practice of orthodontia and orthopedia of the face we are seeking the most practical methods of correcting malocclusion of the teeth and improving the outline of the features. For many years it has been the aim of the writer to develop a system that would meet all requirements and cause the least discomfort to the patient during the use and manipulation of the appliances. After carefully considering the different means of causing force for regulating I adopted the metal spring, as by its use force is applied for a longer duration without interference or change of form than by methods generally employed, patients usually being seen but once a week. The degree of force to be exerted is governed by the size of the spring employed.

The anchorage of the appliances to the teeth is gained by means of partial clasps and spring-clasp attachments over one or more molars or bicuspids on each side of the arch. The effect of the spring-clasp attachments in grasping the teeth is similar to the action of the rubber-dam clamp. To the spring-clasp attachments and partial clasps is soldered a large wire of suitable shape to form the foundation of the regulating appliance. It is termed the base wire or body of the appliance. From this body, springs or arms of wire are extended on the principle of human arms or fingers, which are shaped in the required form for moving the teeth by pushing or pulling them in the desired direction. In making the springs the shape is best determined by imitating the curve that one's finger would take in moving a similar body. This kept in mind assists one in designing the apparatus on a plaster model.

It is my purpose to speak briefly of the adaptability and some of the other advantages of the Jackson system for regulating teeth. It is applicable to all forms of irregularity and at any age; it is readily removed by the patient for cleansing. It does away with the objectionable features of other methods, such as the use of collars as a general means of anchorage, which require the wedging of the teeth for their application, and then the cementing of the collars to the teeth; the fitting of collars to the teeth with screw and nut; the time required for the adjustment of screws, tubes, nuts, and ligatures for utilizing force; the use of ligatures about the teeth, which are liable to slip and injure the gum, and which need frequent replacement; their uncleanliness, etc.—methods generally demanding that the patient be seen every one, two, or three days. As the force of a spring of suitable size is continuous for a week or more without change, requiring that the patient be seen only once in that period, it has an advantage, as on an average, at least six times as many patients can be seen as when an appliance with either ligatures or screws is used. There should be no discomfort to the patient when force is applied gradually by a spring appliance that has been properly made and fitted on an accurate model.

Generally an appliance with springs of this character can be made by the experienced in about an hour. It has been charged that the making of the appliances is difficult to learn. This is a mistake, as the principle of the construction of the appliances for the different movements of the teeth can generally be acquired in a few hours. In this connection, it will be remembered that but a few years ago it was claimed that crown and bridge work would remain in the hands of specialists. Now nearly all practitioners do more or less of crown and bridge work. There is no reason why general practitioners of dentistry with ordinary mechanical skill, if they have the time and desire, should not take care of a large percentage of the cases of irregularities of their patients, by setting aside one hour of the day when patients can call to have additional force applied by bending the springs, which usually takes but a few moments. This plan is carried out by some practitioners for treating teeth and making examinations. Attention will be called to a few important appliances that are not generally understood.

When the teeth are irregular they are usually crowded, requiring that the arch be expanded for their correction. When expansion is necessary, it should usually be done when the irregularity first becomes apparent or soon after, while the jaw is in the developmental stage, thus encouraging a normal growth. The expansion of the dental arch early in life sometimes proves more effective than its expansion later. The expansion of an arch of deciduous teeth by my system is usually not more difficult than expansion of the arch after the permanent teeth are in position.

Generally the distal part of the arch is broad enough. In such a case, when other portions of an upper arch need expansion laterally, an apparatus is constructed as seen in Fig. 1. A palatal base wire, about No. 13 gage, is arranged to follow the palatal curve, crossing the distal part of the arch where it is sufficiently broad. The ends of the base wire are bent forward and inclosed in the anchorage. Force is developed by bending outwardly the anchorage portions, or the arms, causing the lateral expansion of the anterior part of the arch. When the distal part of the upper arch is not broad enough, and its expansion is desired, the palatal base wire is located far back, with the arms extending forward to enter the center of the anchorage portions, and properly soldered. (Fig. 2.) With the appliance made in this manner, the distal or anterior portion of the arch can be broadened at will, or the whole arch be broadened by shaping the arms of the base wire as required.

In expanding the lower arch, an appliance of the same general principle is employed, using a lingual base wire with arms extending backward to enter the anchorage portions, as seen in Fig. 3. A similar appliance was used in the case of a boy of seven years, of nervous temperament, in which the disparity in the size of the arches was so great that the teeth of the lower arch closed entirely inside the circle of the upper arch, none of the teeth occluding. The lower arch was expanded laterally, by bending outward slightly at intervals of one to two weeks the lateral arms of the base wire. The incisors were forced outward by finger springs extending forward from the anchorage portions, one on each side of the arch. The jaws were harmonized as illustrated in the casts I here present. The same appliance was used for retaining. I would like to ask what other method could have been employed to accomplish this result—expanding the lower arch so extremely, with the deciduous teeth present, without discomfort or the patient shedding a tear?

Fig. 1.

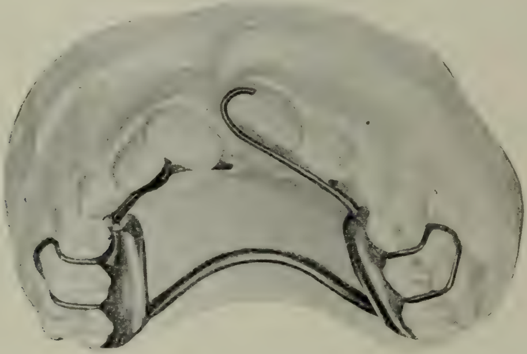
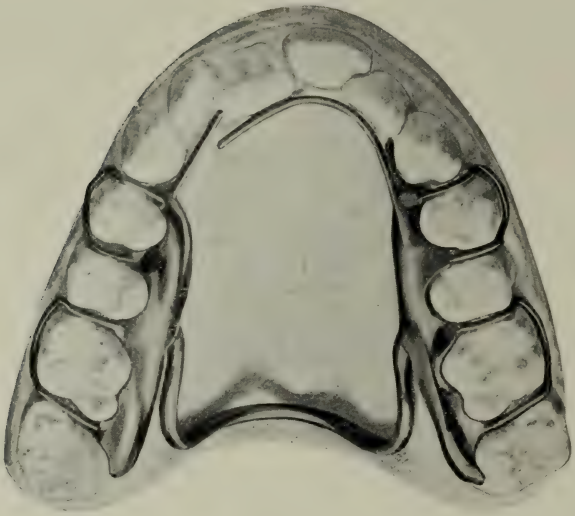


Fig. 2.



Not infrequently *contraction* of the dental arch is required. The contraction of the upper arch is accomplished by an apparatus made with either lingual, palatal, or labio-buccal base wire, according to the movement desired. The palatal base wire with arms projecting forward is used for contracting the arch laterally by being arranged to cross the distal part of the arch, the arms extending forward to enter the center of the anchorage portions, as shown in Fig. 4. In place of ordinary spring clasps for anchorage, continuous spring clasps are employed. Force is developed by bending inward the arms of the base wire. When contraction of only the distal part of the arch is required, a labio-buccal or lingual base wire can be used. Fig. 5 illustrates an appliance for this purpose, with a lingual base wire anchored by partial clasps and continuous spring clasps. Force is exerted by bending inward the sides of the base wire. When at the same time the anterior part of the arch needs contraction, a semicircular spring with U-shaped loops is formed to cross the labial side of the incisors. The loops are arranged to project up under the lip, one opposite each canine, and the ends of the spring are soldered to the continuous spring clasps. Force for moving the incisors inward is secured by closing the U-shaped loops. A semicircular spring with U-shaped loops for contracting the anterior part of the arch is also used in connection with a palatal base wire.

FIG. 3.

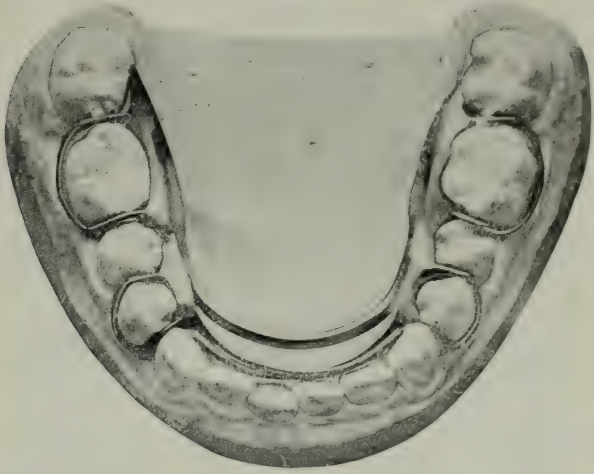
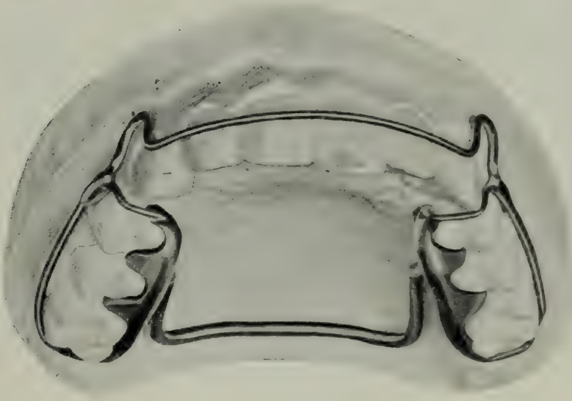


FIG. 4.



I am often asked how I equalize the jaws. Of course the method employed is governed by the requirements. In case of extreme upper protrusion with receding lower jaw, elastic ligatures are sometimes employed. An appliance is anchored to the teeth of the lower arch by partial clasps and spring-clasp attachments (Fig. 6), and a hook attached to the apparatus in the distal part for a rubber equalizing band that extends to a similar hook on the anterior part of an apparatus in the upper arch. Sometimes, in place of a spring clasp attachment passing over the last molar, especially when it is not well erupted, the anchorage is improved by soldering a wire to the anchorage portion of the appliance opposite the linguo-distal surface of the molar. The wire is shaped to pass back of the molar and curve forward to rest on the buccal surface, forming a wire clasp, one on each side of the arch. The end of the wire is bent backward on itself sufficiently to form a hook for the attachment of a rubber band; or a separate wire in the form of a hook can be soldered to the end of each of the wire clasps. In case the last molar tooth is not well erupted, the anchorage is strengthened by cementing to the tooth a collar with a slight metal lug on either the buccal or distal side, the lug being located on the collar so that it will project a little over the wire

FIG. 5.

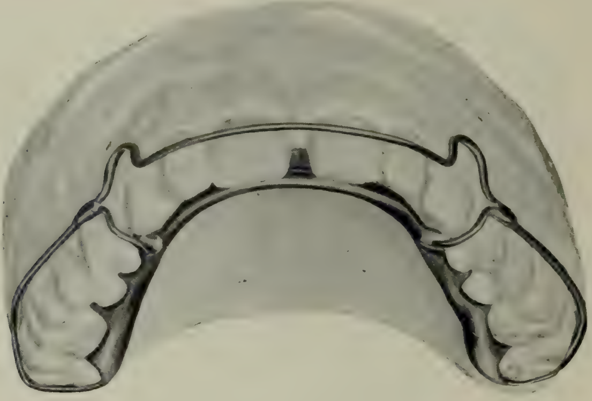
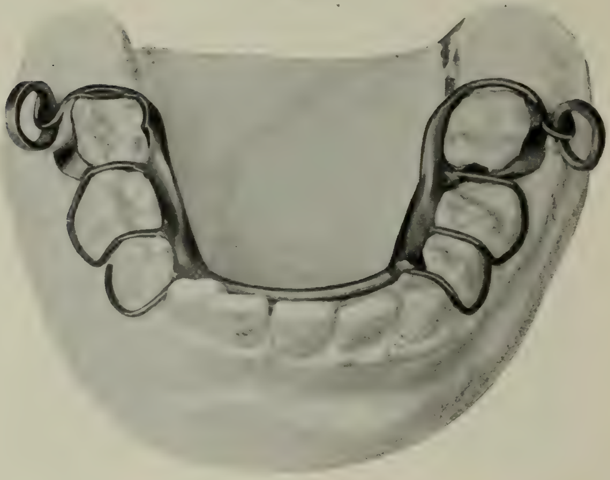
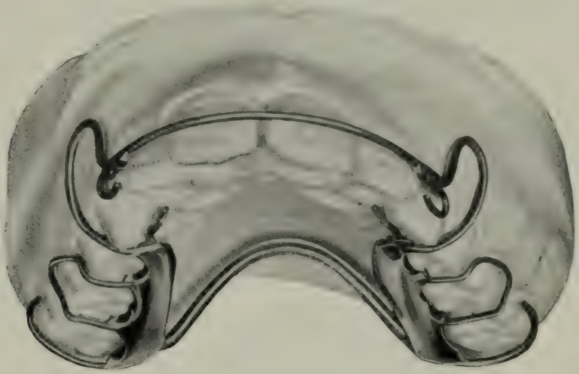


FIG. 6.



clasp, to prevent it from rising up when force is applied by the traction of the equalizing bands. When additional support of the appliance in the anterior part of the arch is required, a collar with a lug to project over the base wire can be cemented to one or more of the incisors. An appliance made in this manner is readily removed by the patient, by first pressing outward and backward the wire clasps with the finger, unlocking them from the lugs. This means of anchorage permits and insures thorough cleanliness of the apparatus and the teeth.

FIG. 7.



An appliance adjusted to the teeth of the upper arch is made similar to Fig. 7. When the teeth are regular, a lingual base wire is employed. If the teeth are irregular, the appliance is generally made with a palatal base wire anchored by partial clasps and spring-clasp attachments, and a wire clasp around each of the distal molars. A semicircular spring with U-shaped loops is arranged to pass in front of the incisors. To the semicircular spring are soldered hooks. The hooks are located opposite the canines, and attached to the wire just in front of the U-shaped loops. When there is a tendency for the apparatus to become dislodged by the downward traction of the equalizing bands, it is retained by cementing to one or more of the incisors, usually to the laterals, a collar with a slight lug on the labial side, suitably shaped to support the semicircular spring. When the appliances are properly adjusted, one or more equalizing bands are stretched from the hooks of the lower appliance to those of the upper on each side of the arch, as shown in Fig. 8.

When the reverse traction is required, as in forcing outward the upper arch and inward the lower, it is generally necessary to adjust collars with lugs to the last erupted molars of the upper arch, as described, to assist the anchorage of the appliance, and to cement collars with lugs to the lower lateral incisors or canines for supporting the lower appliance. Many variations are used.

The cast here presented illustrates the position before treatment of the teeth of Miss R., age fifteen years. It was a case of tardy development of the upper right canine. There was no prominence of the alveolar process to indicate the presence of the canine, but the accompanying X ray revealed the tooth in an impacted condition. The arch was too narrow and it was therefore expanded by an appliance with a palatal base wire, as illustrated in Fig. 9. The arms of the base wire were bent outward for expanding the arch laterally, and space for the canine was gained by moving the incisors laterally toward the left. For this purpose a looped spring was arranged to extend from the anchorage portion of the appliance on the right side opposite the palatal side of the first bicuspid, forming a loop about one-half inch long, projecting toward the median line and the end curved back to rest on the distal surface of the lateral. Force was exerted by opening the loop slightly once in two weeks. The casts show the change after four visits.

chemically pure tin for solder flowed with the soldering iron.

Wires for appliances should always be examined to determine that they are sufficiently springy and not brittle, as almost all springy metals, especially base metals, gradually deteriorate with age and lose their elasticity and become brittle.

Fig. 8.

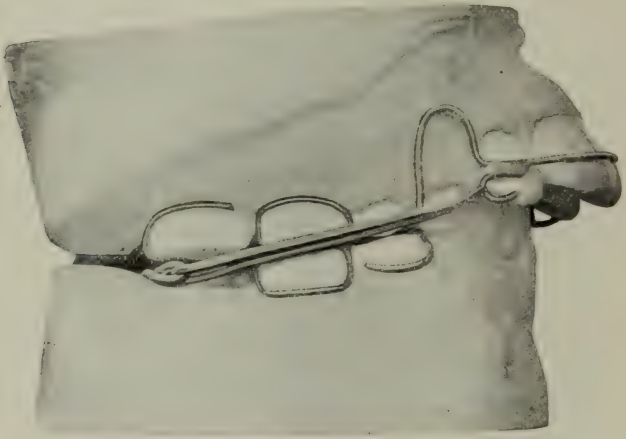
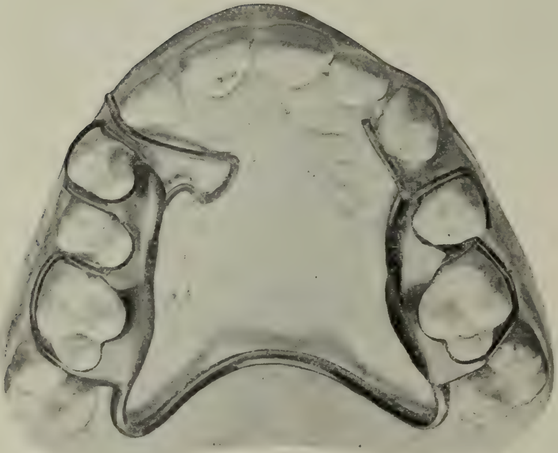


Fig. 9.



In making appliances partial clasps of gold are recommended; 18-karat gold plate or finer is rolled to No. 36 standard wire gage. When gold is used for partial clasps, gold solder is employed, or

THOUGHTS ON THE DEVELOPMENT OF CROWN AND BRIDGE WORK: WITH SOME PRACTICAL SUGGESTIONS.

By H. HERBERT JOHNSON, D.D.S., Macon, Ga.

(Read before Section I of the National Dental Association, Buffalo, N. Y., July 29, 1905.)

IN order to refresh our memory and bring to mind a few incidents connected with the development of crown and bridge work, I have deemed it advisable to recite some facts connected with its past history. These statements are not made from memory, nor are they hearsay, but are matters of record, therefore their general correctness can hardly be doubted.

In vol. xvii, page 403, of the DENTAL COSMOS (August 1875), appears an article by Dr. H. C. Register, in which he describes a method of setting an artificial crown by using a vulcanite plate tooth backed with rubber. It was set by first filling the root-canal with a hard-wood peg and afterward putting a threaded gold wire through the hard-rubber backing into the wood post in the root. The crudeness of this operation and the prominence of the essayist leads us to presume that the setting of artificial crowns on the natural roots of teeth had made little progress toward any degree of perfection even as late as that date—1875.

In the November issue of the DENTAL COSMOS of the same year there is an exhaustive idea in crown work by Dr. Theo. F. Chupein, then of Charleston, S. C., read before the Pennsylvania Association of Dental Surgeons. This idea, boiled down, is to fit a gold tube into the enlarged canal by threading one end and screwing it into place, depending on the threaded end to hold it securely. A disk with a split pin is then fitted to the ground surface of the root, and a plate tooth soldered to this, making a sort of modified Richmond crown, but instead of cementing, depending on the spring in this split pin to hold it in place in the previously adjusted gold tube. One advantage claimed was that it could be removed for repairs in case of accident to the porcelain facing.

The discussion which followed the reading of the paper is interesting. Dr. W. H. Trueman advised placing a small bit of cotton in the split pin in order to assist in the spreading and keeping it tight and firm. Dr. E. H. Neall said that there had undoubtedly been great advancement in pivoting teeth in the previous ten years, yet he believed that little improvement had been made, so far as durability was concerned over the old method of wood pivots. The plan mentioned, he said, required very minute work, and was expensive. He had inserted but few pivots for several years, but these had given considerable satisfaction. Professor Buckingham said that he usually used wood pivots. He had used tubes, but seemed to consider it too much trouble. In former times many more roots were pivoted than at that time, and it had been customary to drive the wood pivots with a hammer; this, with the fact of the pivot being too tight, usually gave rise to trouble. In his later practice he forced them up with a notched plugger, putting a little zinc chlorid to fill the interstices. He also used Hill's stopping and in some instances amalgam; in one case he had used amalgam and a silver post. In another case of short bite he had used a cross-pin tooth, which afterward broke. He then made a gold tooth which lasted six years. He had recently extracted seven pivot teeth in one mouth which were firm. Some of them had been worn twenty years. Dr. Wert said that he used very few pivot teeth, finding them too expensive. In making pivots he drilled through hickory wood in the root and inserted a gold wire.

In vol. xxi, page 261, of the DENTAL COSMOS (May 1879), in relating incidents of office practice before the New York Odontological Society, Dr. N. W. Kingsley said: "An interesting operation was performed in my office a day or two since by Dr. Richmond. As it was an excellent case upon which to demonstrate Dr. Richmond's plan, I called him in, and the result was one of the prettiest operations I ever saw." The operation spoken of consisted in making a Richmond banded crown for the broken-down root of a bicuspid.

Dr. Abbott, in the same meeting, said: "The process which Dr. Kingsley has spoken of I attempted to perform myself not long since. I had made an appointment with my patient, supposing I could readily obtain the services of Dr. Richmond to do the work for me, but was unable to find him." Dr. Abbott varied the operation a little, but made it substantially after Dr. Richmond's banded method. These crowns were all set with zinc oxychlorid, os artificiel, or Hill's stopping.

Dr. Wm. Jarvie, at a subsequent meeting of the New York Odontological Society, in the same year (1879), described a case very much after the style of the porcelain-faced disk crown commonly known as the Morrison crown, except that he did the fitting of the wire posts and disks to a cast previously taken of the mouth, instead of fitting it to the natural root in the mouth as we do now. This crown had no band and was fastened with Hill's stopping (gutta-percha).

Dr. J. N. Crouse, before the American Dental Association at Saratoga in August 1879, commended the process of setting Richmond crowns. He had had the pleasure of seeing two crowns attached together, one root carrying both, and liked it very much.

Dr. G. R. Thomas of Detroit said: "Dr. Richmond's method of fastening gold crowns on roots meets a want which all have felt. I have one in my own mouth, condemned to the forceps previously, but now doing good service."

The well-known Bonwill crown made its advent in the year 1880. An illustrated paper appears in vol. xxii, page 410, of the DENTAL COSMOS (August 1880), by Dr. W. G. A. Bonwill, in which this crown is minutely described.

On page 463 of the same volume is a paper on gold crowns by Dr. Eugene S. Talbot. In this paper he says: "The credit for the suggestion of gold crowns is due to the late Dr. B. Beers, who settled in California in 1849. He received a patent for his invention in 1873. While in San Francisco in the spring of this year (1880), I had the opportunity of examining several crowns inserted by him and which had stood the test of more than seven years of service Owing to the death of Dr. Beers, in 1874, but little has been done toward bringing this valuable invention to the notice of the profession."

Before the First District Dental Society of the State of New York, in January 1892, in discussing papers on crown work, Dr. E. Parmly Brown makes the statement, which was not refuted, that not one-quarter of the members of the First District Dental Society were at that time furnishing bridges for their patients.

It would be exceedingly interesting to pursue the history and development of crowns further, bringing it right down to the present time, but the limit which has been placed on the length of this paper by the committee will prevent.

From the few historical facts recited we will come very aptly to the conclusion that modern crown work was almost unknown or very crudely performed until sometime after the year 1880, and that bridge work was not in general use as late as January 1892.

In following carefully the development of crown work we deduce the following facts:

That the first methods in use were bandless crowns, imperfectly adapted to the surface of the root, and held mechanically by either a wood peg or threaded gold wire, or both. The absence of any medium to close up the crevice between the surface of the root and crown usually resulted in failure by chemical disintegration of the root. In all instances where the root was able to resist the ravages of recurrence of decay, and was not split open by the force of biting, the operation was of sufficient permanence to be considered a success. Even a partial success of the crude methods and imperfect materials cannot fail to impart to us a great amount of encouragement.

Then came the advent of the banded crown, which consisted of a band made of gold plate to encircle the entire circumference of the root and driven on tightly, even in many instances being forced up beneath the gum margin far enough to hide the presence of the band entirely. These were held in place by using some plastic material, as cement or gutta-percha, to fill in the interstices to perfect the fit. Great difficulty was experienced in properly preparing roots for the reception of these bands, and equally great difficulty was found in fitting the band so that irritation and inflammation would not result. These banded crowns, however, in conjunction with the all-gold ferrule crowns, made possible that class of work which has proved such a blessing to mankind, *i.e.* the modern bridge. This banding idea at first seemed to embody all the essential features necessary for the restoration of the lost natural crown, but it soon became apparent that while the necessary strength was obtained, the foundation was quickly jeopardized by the excessive inflammation set up, especially on the anterior surface where the gum tissue was thinnest and most susceptible to irritation. Recession of the gum would surely occur within a comparatively short time, leaving an unsightly band of gold exposed to view, and in many instances disclosing a misfit which had heretofore been considered quite perfect.

In casting about for something to take the place of this irritating band and yet give the strength necessary for permanence, various ideas have been suggested, among the first a half-band made of gold plate of about 22 k. and No. 29 gage, that should encircle only the palatal half of the root, with a disk burnished over the ground portion, and extending only to the gingival margin on the labial or buccal side. As the splitting of roots was nearly always caused by the outward force of biting, this gave strength where it was most required. This arrangement was, however, more difficult to make than the whole band, as far as any perfection of fit was concerned, and while the tough gum tissue on the palatal side would stand a great deal of abuse, it also would in due time yield to this severe irritation and recede more or less rapidly.

Then, as a substitute to all the suggestions made and with the sole purpose of overcoming the band with its resultant objections, the Morrison style of crown came into use. The Morrison crown was made without any band at all. It was simply a disk of thin 24-k. gold burnished over the face of the root, with a platinum pin pushed through and soldered, and a porcelain facing attached to this foundation. While this obviated the pain of fitting and the subsequent irritating influences of the band, it had not the strength which was the principal claim for its introduction.

Past experience is fast bringing the profession to a proper appreciation of the burnishing methods, employing the pliable thin 24-k. gold as the base in all methods for restoring large portions of lost crown tissue. Cast gold fillings or burnished crowns, brought so prominently to our attention and used with such artistic results by Dr. C. L. Alexander of Charlotte, N. C., will in a great many instances completely restore a tooth to its former shape and usefulness without rendering necessary the employment of an encircling irritating band of gold plate, and is always to be preferred when indicated.

Taking advantage of the ease of adjustment and perfect adaptation possible with the burnishing methods before spoken of, I have for some years employed these ideas in all crowns of the porcelain-face class with great satisfaction, and likewise in many of the all-gold telescoping crowns. These suggestions are therefore advanced with a view to overcoming some of the weak points and objectionable features of many of the more modern crown ideas and in the belief that they are thoroughly practical. While the method is not startlingly new, some features of it have not to my knowledge been heretofore illustrated in any publication.

FIG. 1.

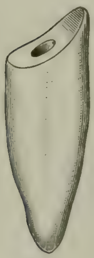


FIG. 2.

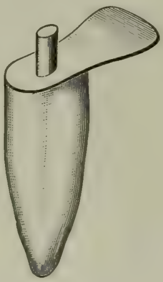


FIG. 3.

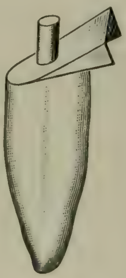


FIG. 4.

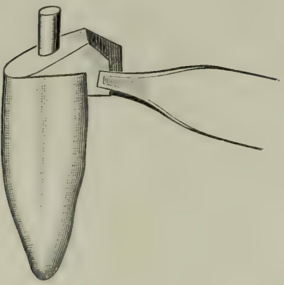


FIG. 5.

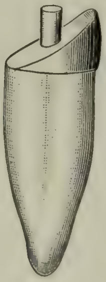
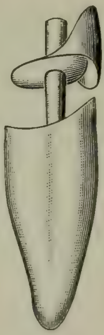


FIG. 6.



In preparing the root for the reception of this crown it is advisable to leave as much of the palatal portion of the root as the conditions presenting will allow, cutting it very low in front, even a little below the gum margin, as illustrated by Fig. 1. Of course, the remaining enamel must be removed on the palatal side. The canal having been enlarged and a piece of iridio-platinum wire of suitable size and depth adjusted therein, a piece of 24-k. gold rolled very thin, slightly thinner than No. 36 gage, is next selected with which to form the half-cap for the root. This piece of gold is cut wider than the greatest width of the root and considerably longer than the length of the face of the root from before backward, so that when the previously prepared piece of iridio-platinum wire is passed through and soldered, the conditions will be such as is illustrated in Fig. 2. The piece of gold is now burnished at the anterior third of the surface of the root sufficiently to indicate the exact margin, the piece removed, and all surplus cut away at this point, so that there should be no overlapping but just enough of the gold to cover exactly that portion of the face of the root to its margin, as illustrated in Fig. 3.

The approximal sides of the disk are next burnished to these surfaces and also to the extreme palatal portion, with the view of obtaining the half-cap. This burnishing will form some creases or ears at the two approximo-palatal points of the root. With a pair of pliers these creases are drawn tightly together, as shown in Fig. 4. These flaps or creases are then burnished down right and left into close adaptation to the respective surfaces of the root; in fact, all the surfaces are now burnished carefully as shown in Fig. 5. On account of the thinness and pliability of the gold used, these laps can be burnished out completely, and the lapping is not objectionable.

FIG. 7.

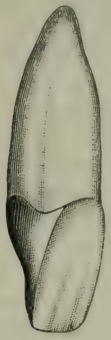
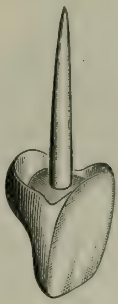


FIG. 8.



The formed half-cap is now carefully removed, taking care to prevent a change of shape, and is painted inside with a solution of chalk mixture to prevent the solder from flowing through, and thickened and strengthened by flowing 22-k. gold solder all over the outer surface, as shown in Fig. 6.

This completes the formation of the cap, and the remaining steps are the same as in the making of any porcelain-face crown. The cap is placed on the root, a bite and impression is taken, a model is run, and after placing the whole in a crown articulator a facing is selected, ground, backed, and waxed to the cap now on the model, Fig. 7. The cap and facing are now united with solder, and the crown finished as shown in Fig. 8.

The claims made for the process are—Strength where needed to bear the strain of the outward force of biting; a cap accurately adapted and adjusted so that only a minimum amount of irritation, if any, will ever arise to cause after trouble. I may say that very thin platinum may also be used instead of the thin gold, where for any reason it may be preferred.

The value of this burnishing method in crown adjustment is very apparent, and it can be varied to suit nearly all cases. The promise of permanence and durability which attends the operation of cementing porcelain inlays, and all work of like character where the interstices to be filled are reduced to the minimum, will lend additional encouragement to this class of crown work. In the future I feel sure that some such methods will be employed entirely, to the exclusion of all irritating bands.

SOME PHASES OF CROWN AND BRIDGE WORK.

By **W. STORER HOW, D.D.S., Philadelphia, Pa.**

(Read before Section I of the National Dental Association, Buffalo, July 25, 1905.)

FELLOW members of Section I, N. D. A., Buffalo meeting, 1905: Accepting the earnest invitation of your chairman, Dr. T. P. Hinman, I have the honor to present a paper on "Some Phases of Crown and Bridge Work."

The object in view is to graphically exhibit some typical forms of *pier-span substitute bridges* that since 1869 have been described and depicted in the Dental Cosmos, and the electrotypes of which may be available for the pictorial presentation. Had time and opportunity permitted, other accessible illustrations might have been included, to give the paper a more completely illustrated aspect. The journal mentioned is implied in all the references, and space-economy compels editorial brevity of description; the figure numbers are those of the present paper. With the illustrations in view, the skilled dentist can usually supply details of constructure or modify the examples shown, while the references will enable the inexpert to "read up" on the subject.

In the plan of this paper its purposes were—

First: To collectively recall and record some phases of the early and later developments of special forms of dental substitutions which have resulted in a distinct department termed "crown and bridge work."

Second: To group and graphically portray the progressive devices so begun and combined that the expert dentist of today, and the future, may readily utilize, partially or completely these ingenious practical prosthetic products of his predecessors.

Third: To suggest an avoidance of the procrastination that awaits an occasion for essays of epitaph, and fanciful floral decorations, and funeral directors' ceremonies following the demise of the dear departed; whereas a due modicum of present praiseworthy taffy, and a few bright flowers of speech, would warm the cockles of the heart in our contemporary benefactive inventors who have honored our profession as special curators and guardians over the gateway for the sustenance and speech of the crowning creation, Man.

THE BING BRIDGE.

Dr. B. J. Bing, Paris, France (October 1869, p. 509), originated the pier, span, and stop bridge, which for a central substitute requires—Cut cavities in the near central and lateral with two little griffes (stops) soldered to the sub backing, the stops of which are with gold foil stopped into the pier cavities. The bridge "is solid, stationary, and can be cleansed as well as the natural teeth."

(The writer prefers "substitute" to "dummy," and for brevity uses the abbreviation "sub" as the substitute tooth-crown unit.)

Dr. M. H. Webb, Lancaster, Pa. (June 1873, p. 291), shows in Fig. 1 a pier and saddle-span to rest on the gums and be soldered to the two-stop backing of the sub central to form a modified Bing bridge.

Dr. Webb furthermore (December 1879, p. 668) shows a like bridge having stop posts for the canals of the left central and right lateral. (See Fig. 2.)

FIG. 1.

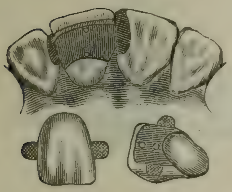
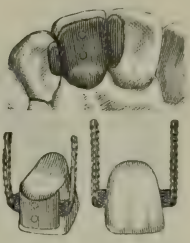


FIG. 2.



Dr. Wilbur F. Litch, Philadelphia, Pa. (August 1880, p. 396), illustrates by Figs. 3 to 6 his wing-plate and pier-post, or pin-plate bridges.

FIG. 3.

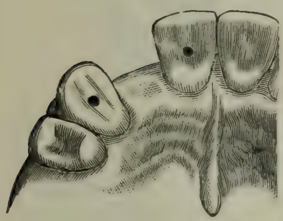


FIG. 4.

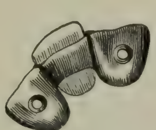


FIG. 5.

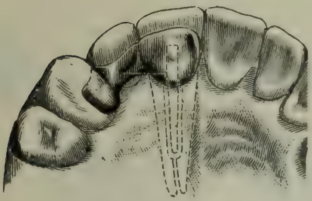
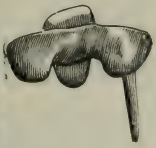


FIG. 6.



Dr. H. C. Register, Philadelphia (May 1881, p. 260), describes a die-struck saddle to which are soldered stops and screw-with-nut posts, Fig. 7. After the saddle-span stops have been fixed in the piers, the perforated porcelains are removably mounted; Fig. 8 shows one such bridge.

FIG. 7.

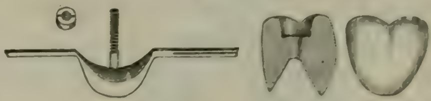
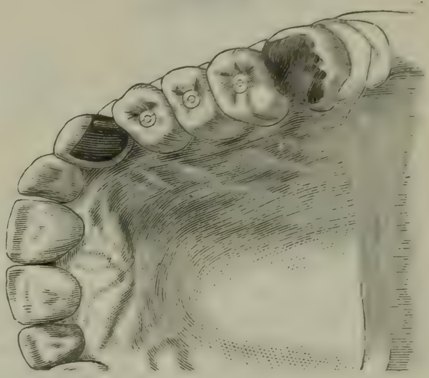


FIG. 8.



Dr. M. H. Cryer, Philadelphia (July 1882, p. 360), illustrates the backed and soldered two-stop saddle and pier post, modified Bing bridge, shown in Figs. 9 and 10.

FIG. 9.

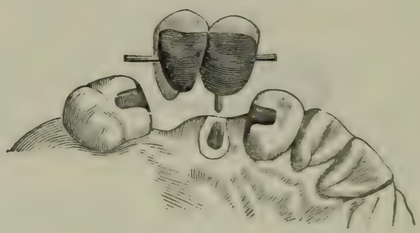
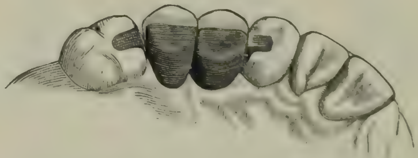


FIG. 10.



Dr. E. T. Starr, Philadelphia (August 1887, p. 539), shows in Figs. 11 and 12 the four-stop porcelain tooth that remedies a radical defect in the two-stop sub, which is liable to rotation on its trunnion-like stops; whereas these duplex stops maintain the verticality of the sub in its stopping relation to the piers. Furthermore, these platinum stops provided for union by baked body or by solder to form clear span or saddle-span bridges of every Bing type.

Fig. 11.

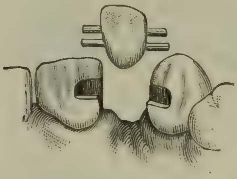
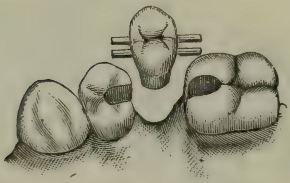
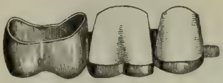


Fig. 12.



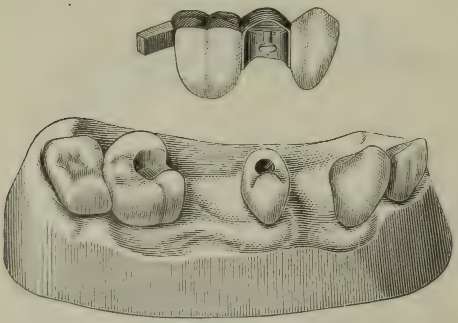
Dr. J. Leon Williams, New Haven, Conn. (January 1884, p. 6), shows in Fig. 13 a Bing-stop, two-sub, and cap-crown bridge.

Fig. 13.



Dr. Wilbur F. Litch, Philadelphia (March 1886, p. 136), in Fig. 14 exhibits a Bing-stop sub, hood with headed pin, and arm-span bridge.

Fig. 14.



Dr. James B. Hodgkin, Baltimore (April 1886, p. 207), illustrates by Figs. 15, 16 a Bing-stop, sub-span, pier-post and screw-with-nut bridge.

Fig. 15.

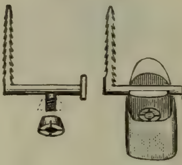
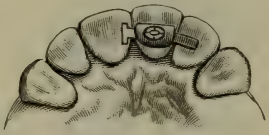


Fig. 16.



Dr. E. Parmly Brown, New York (September 1886, p. 584), shows in Fig. 17 a Bing-stop baked-body sub; and in Fig. 18 exhibits three styles of Bing-stop porcelain sub, and canal-post, pier-span bridges.

Fig. 17.

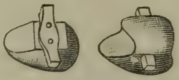
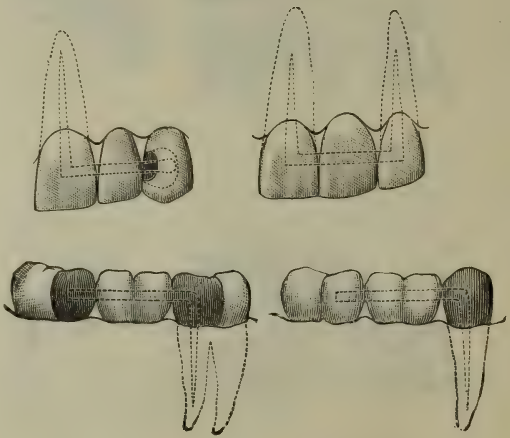


Fig. 18.



(At the meeting of the Pennsylvania State Dental Society in Philadelphia June 28, 1905, Dr. Brown showed, in the mouths of two patients, Bing bridges of the Fig. 18 type and date.)

Dr. J. Rollo Knapp, New Orleans (February 1887, p. 82), illustrates in Fig. 19 a Bing-stop and Richmond crown two-sub bridge.

Dr. Sidney S. Stowell, Pittsfield, Mass. (December 1888, p. 910), shows in Fig. 20 a Bing-stop gum-saddle Richmond crown, two-sub bridge; and in February 1891, p. 132, Dr. Stowell illustrates a Bing-stop porcelain two-sub saddle and socketed span for pier post, and pier-stopping fixation, Fig. 21; this bridge "was not more than thirty minutes in the making."

FIG. 19.

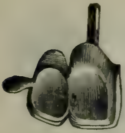


FIG. 20.

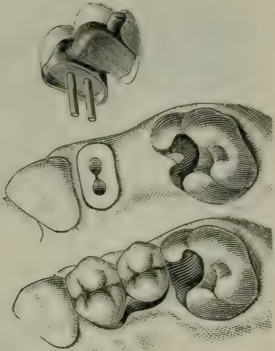
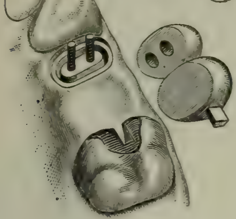
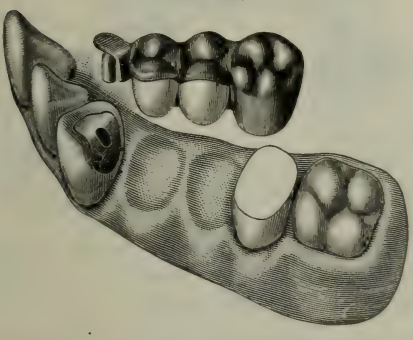


FIG. 21.



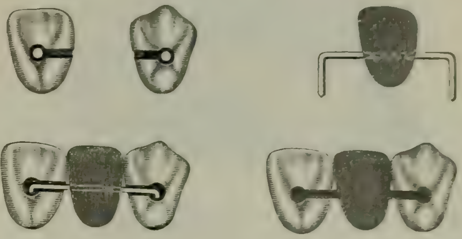
Dr. Stowell (April 1900, p. 354) furthermore shows in Fig. 22 a canine pier having a large gold filling socketed for a vertical pin on a shouldered extension of the two-sub span, and a cap crown for the molar pier, to which the bridge is cemented, leaving the pier pin free for "slight vibrations with the other teeth."

FIG. 22.



Dr. M. L. Rhein, New York (May 1903, p. 371), shows in Fig. 23 a type of Bing-stop canal-post bar-sub bridge work for the fixation of piers loosened by pyorrhea alveolaris.

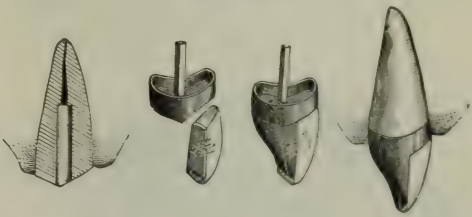
FIG. 23.



RICHMOND CROWN AND BRIDGE WORK.

Dr. J. Leon Williams, New Haven, Conn. (January 1884, p. 1), says: "As the single crown is the beginning and the end of all bridge work, a description of that particular form which is of the greatest practical value will be necessary. This is known as the Richmond crown, though not the crown he claims as his invention. It consists essentially of three parts—a pin [post?] which enters the enlarged pulp-canal; a root-cap of gold; and a porcelain face, which is the ordinary plate tooth." (See Fig. 24.)

FIG. 24.



On pages 2 and 3 he shows in Fig. 25 a Richmond four-sub bridge, the lateral subs being of the wing-extension type. At page 4 he illustrates in Fig. 26, A and B, a characteristic six-anterior-sub Richmond and pier-post bridge.

Fig. 25.

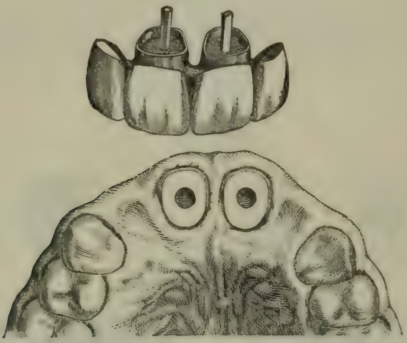
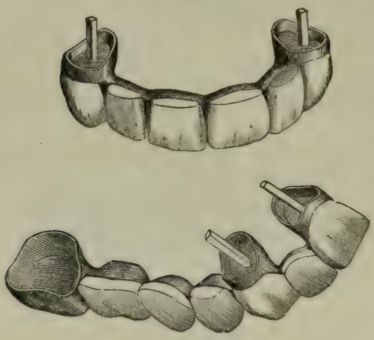


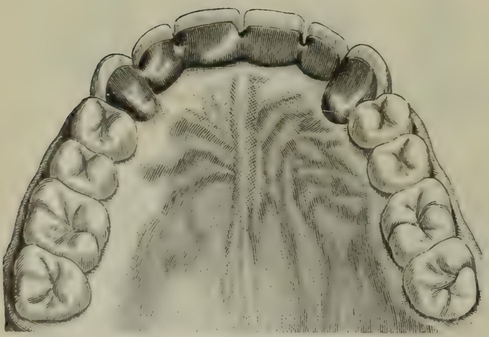
Fig. 26.

A



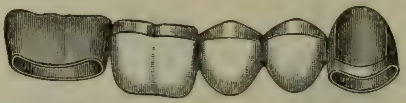
—*Williams*, Dec. 1885.

B



Dr. J. L. Williams, Philadelphia (December 1885, p. 710), shows in Fig. 27 a collared-hood, three-sub span, and cap-crown bridge.

Fig. 27.



Dr. J. L. Williams, Philadelphia (December 1885, pp. 712, 713), shows a Bing-stop, wing-end, coupling-bar Richmond bridge of remarkable configuration, by Figs. 28 and 29.

Fig. 28.

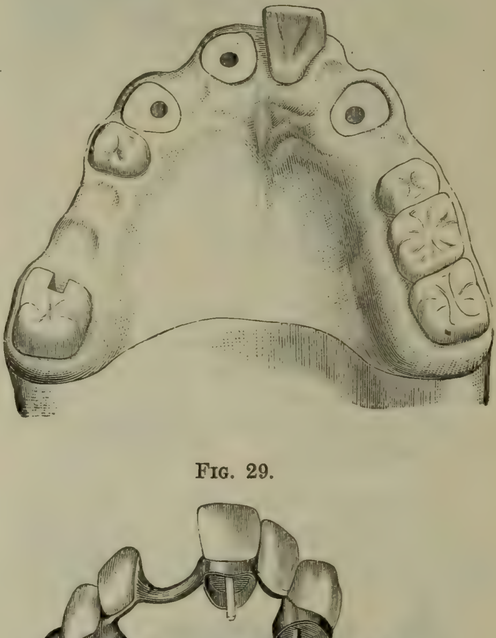
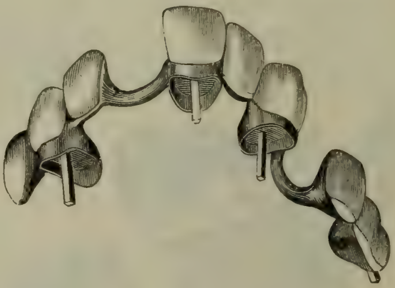


Fig. 29.



Dr. Williams furthermore on page 711 appreciatively illustrated in Figs. 30 and 31 a remarkable combination Richmond cap-crown and wing gum-rest bridge made by Dr. H. A. Parr, New York.

FIG. 30.

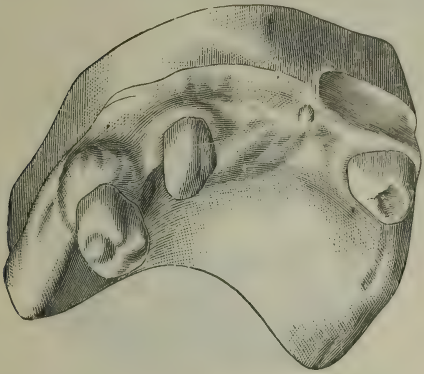
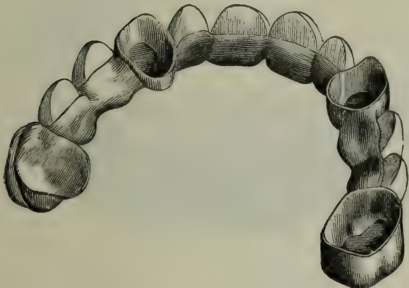
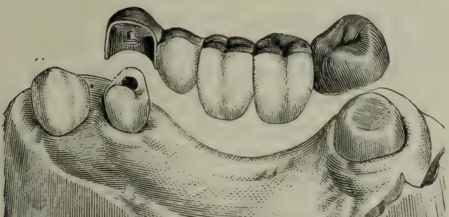


FIG. 31.



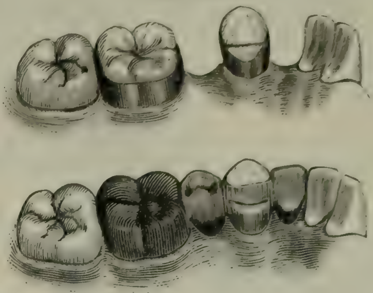
Dr. Wilbur F. Litch, Philadelphia (March 1886, p. 135), shows a half hood and pier-pin three-sub span and cap-crown fixed bridge, Fig. 32.

FIG. 32.



Dr. G. W. Melotte, Ithaca, N. Y. (December 1886, p. 746), shows a cap-crown, one-sub, shoulder-pier, wing-sub bridge, Fig. 33.

FIG. 33.



Dr. J. Rollo Knapp, New Orleans (February 1887, p. 82), shows a Richmond crown fourteen-sub, cap-crown headed-pin, second molar pier and canine canal-post anchorages, Fig. 34.

FIG. 34.

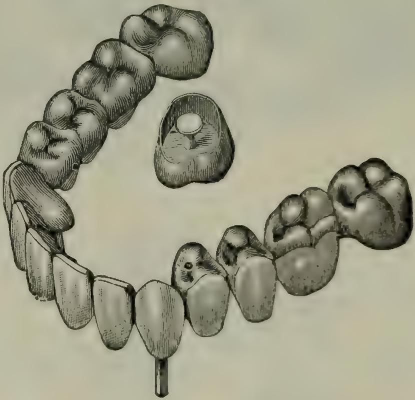
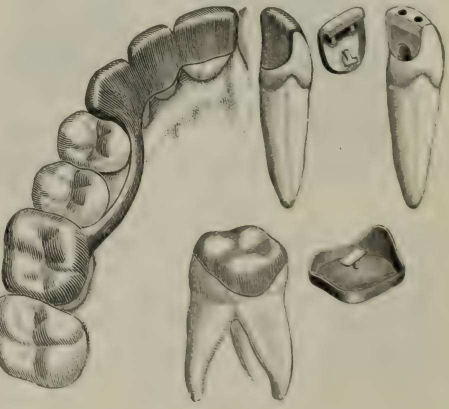


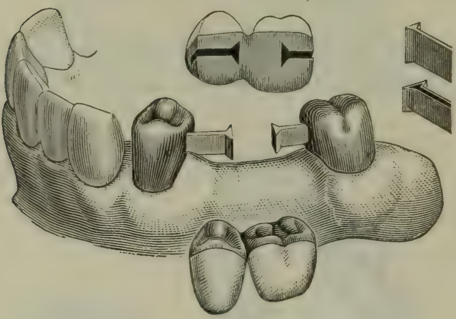
FIG. 35.



Dr. W. E. Griswold, Denver, Colo. (September 1889, p. 743), shows in Fig. 35 cusp-caps with pins for socket anchorage in live piers. He illustrates many forms of this style of bridge work, applicable to all anterior and posterior teeth.

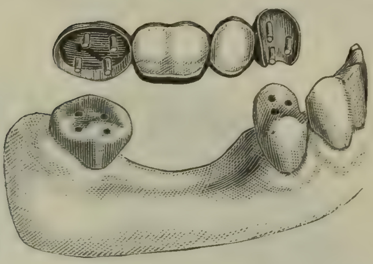
Dr. G. L. Curtis, Syracuse, N. Y. (February 1890, p. 110), illustrates, by Fig 36, cap crowns having soldered stops to be cemented in like sockets soldered in the backings of the subs.

Fig. 36.



Dr. C. L. Alexander, Charlotte, N. C. (October 1896, p. 852), illustrates in Fig. 37 his method of preparing the live piers with retaining sockets for corresponding pins in cast caps, or hoods, to which the subs can be soldered to form a bridge like that of the figure.

Fig. 37.



Dr. J. Leon Williams, London, Eng. (August 1900, p. 736), shows in Figs. 38 and 39, a three-sub span united by baked body and gum, and having canal-post pier-fixation by cement.

Fig. 38.

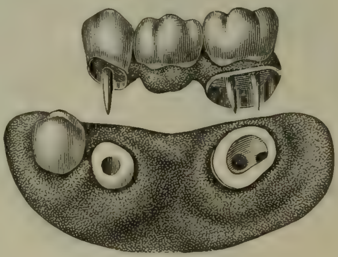
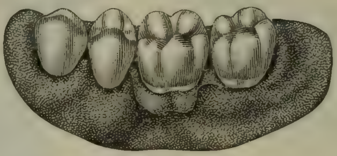


Fig. 39.



In all the modifications of crown and bridge work thus far illustrated, the pier-fixation or anchorage has been designed for permanency.

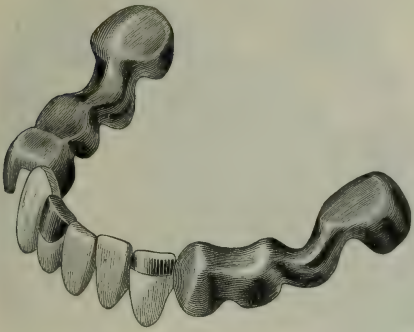
Bridges of the Richmond type, like those of the Bing type, are fixed on their piers more or less securely to prevent displacement in use. Several disagreeable consequences ensue, chief among which are the malodorousness, caries-cultivating, disease-developing effects of food and mucous decompositions under and over the bridge crevices and between the natural teeth.

Difficulties in repair or removal by the dentist are disappointing to the patient and disreputable for the practitioner. Hence the persistent endeavor to devise crown and bridge work that may be removed and replaced by the patient.

REPLACEABLE CROWN AND BRIDGE WORK.

Dr. James E. Dexter, New York (July 1883, p. 346), illustrates his replaceable bridge, the details of its construction requiring about four pages of descriptive matter which two illustrations could reduce to a page. He strikes or shapes caps to fit the piers, and slits one side of each cap to produce a spring grip on its pier. He then connects the caps by span bars to which the subs may be attached in any usual way. The bar-cap union must not interfere with the cap slits to destroy the cap-spring grip on the piers to permit frequent displacements and replacements for its cleansing, and for the cleansing of the natural teeth and gums. (See Fig. 40.)

Fig. 40.



Dr. R. Walter Starr, Philadelphia (January 1886, p. 17), under the title "Removable Bridge Work," shows in Fig. 41 the cast of a case presenting difficulties of an unusual character, "the molars and left second bicuspid overhanging to a degree that would make the taking of an accurate impression by ordinary means well-nigh impossible." In Fig. 42 are shown verticated flat caps cemented tight over the molars, left second bicuspid, right first bicuspid, and canine stump. Gold cover-crowns were made to telescope over all the caps. The two completed bridges were easily replaced on or removed from the supporting capped piers. Dr. Starr is to be credited with this early and complete example of the telescoping fixed cap and cover-crown bridge—as now made, to be removed and replaced by the patient, although Dr. Starr then thought it expedient to employ a connecting film of gutta-percha for heat removal to repair. The further ingenious prosthetication of the anterior stumps, by fitting them with collar-cups, and setting in them, with

Fig. 41.

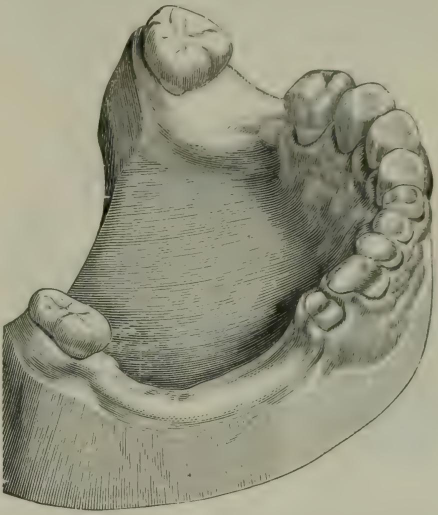
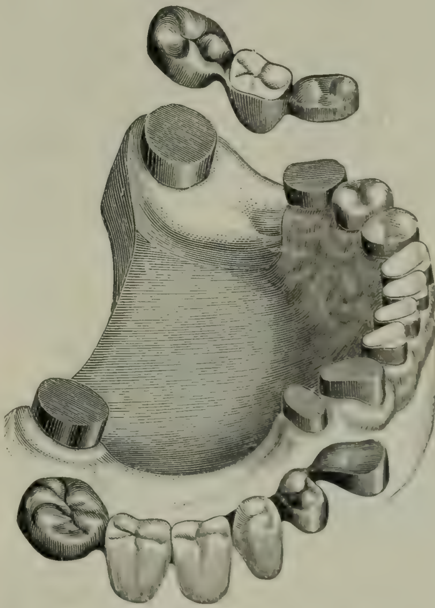


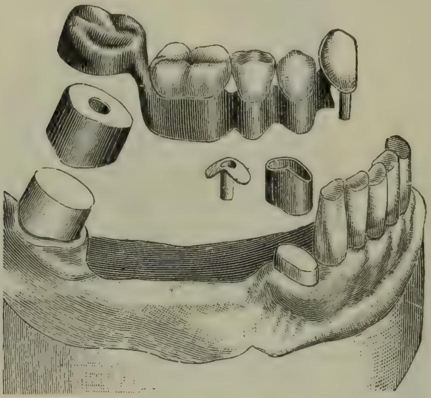
Fig. 42.



gutta-percha, porcelain cusps, was a remarkable restoration to utility which is very well depicted in the illustrations.

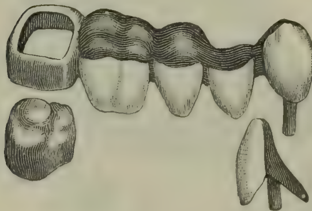
In August 1886, p. 498, Dr. Starr illustrated by Fig. 43 a difficult fixed cap and cover-crown replaceable bridge, with the roof-cap pier and socket tube for the post of the roofed canine sub; the span being composed of united saddle cups carrying cemented porcelain cusp crowns.

Fig. 43.



In the same article, p. 500, he credits Dr. C. M. Richmond, New York, with the removable structure shown in Fig. 44; in making which Dr. Richmond employs a zinc die made from a cast of the pier tooth with its cap on. The illustration also shows his post and roof device in another form than that previously described.

Fig. 44.



Dr. Richmond, therefore, seems to have originated the roof-shaped root-end, which, with its roof-plate and tube for the post of the roof-conforming crown, shown by Fig. 44, constitutes the present preferred pier anchorage for oral-span removable bridges. By this means the gleam of the gold collar and its pericemental perversion of the natural pier are prevented.

Dr. J. L. Davenport, New York (November 1887, p. 671), shows in Fig. 45 fixed capped and tubed canines, and left bicuspid root cap-crowned. In Fig. 46 is seen the clasped and winged saddle plate, telescoping posts, and cover-crowns, forming, with the eleven subs, the doctor says, "the most perfectly fitting piece I ever inserted, requiring great care for its removal, and yet, by a little practice, the gentleman was able to remove and replace it quite easily."

Fig. 45.

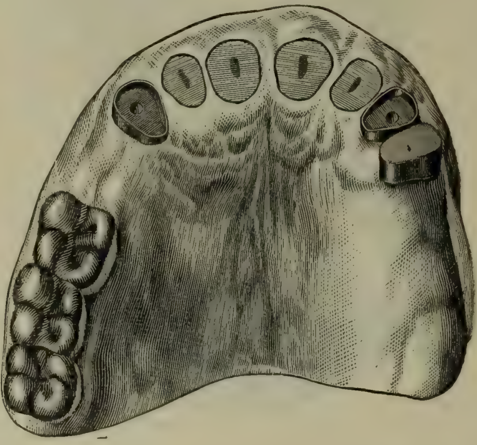
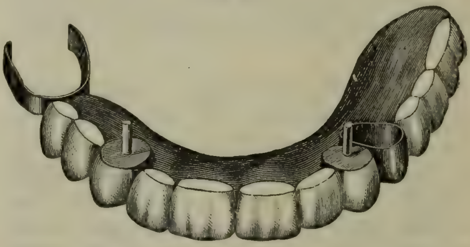
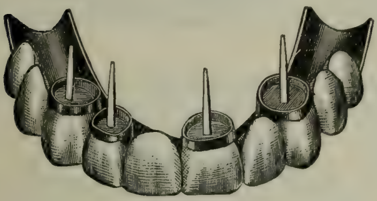


Fig. 46.



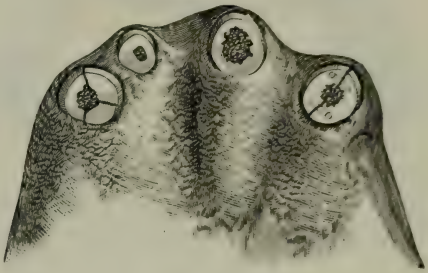
Dr. R. Walter Starr, Philadelphia (February 1888, pp. 66, 67), shows in Fig. 47 an ingenious and successful Richmond saddle denture. A thing miscalled a bridge had wrecked the roots of the long-suffering and stench-sickening patient, past eighty years in age, but who still pleaded for another attempt at restorative substitution.

FIG. 47.



When some recuperative progress had been made, the left canine was found split nearly its length. It was wound and bound with fine wire; anchor screws obliquely placed held the parts together, and the wire ferrule was replaced by a tight collar. The right canine had been thrice split, and the mesial portion came away: a like die-struck pure gold plate with headed pins in its convex surface was wire-ferruled in place, after the canal cavity had been undercut with burs. (Fig. 48.) Dry amalgam was packed in the cavity and around the pinheads. Subsequently the wire ferrule was removed, the splint and root collared, and a post-hole drilled. After six curative weeks the fitting of the lateral and central subs with caps and posts and the fitting of telescoping caps over the canine collars were proceeded with, and short saddles struck to fit the gums behind the canines. The completed bridge is shown by Fig. 47.

FIG. 48.



A piece of lower bridge work over the much-abraded anterior teeth completed the structure, which after more than a year's use had occasioned no discomfort and was enthusiastically appreciated as a practical prosthetic achievement.

Dr. George Evans, New York (December 1888, p. 887), illustrates, in Fig. 49, cap-crown piers having gingival stops, to limit the thrust of the telescoping collars coupled by the gum-saddle span on which the subs are mounted to complete the replaceable bridge, Fig. 50.

FIG. 49.

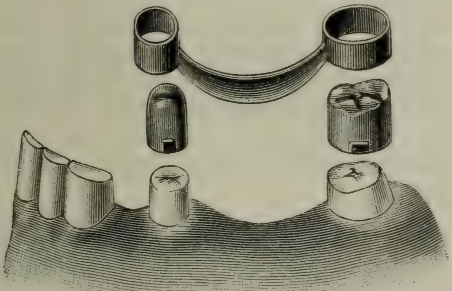


FIG. 50.

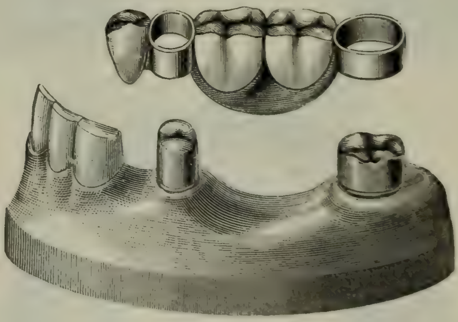


Fig. 51.

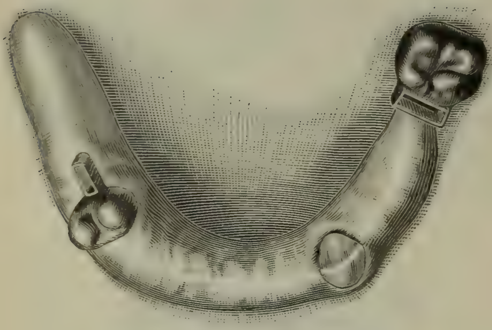
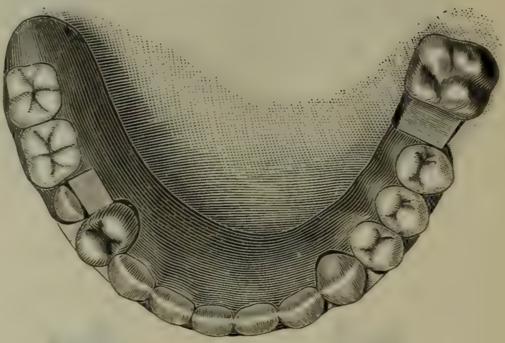


Fig. 52.



Dr. H. A. Parr, New York (March 1889, p. 173), shows in Figs. 51 and 52 a removable saddle structure replaceably secured by boxed lugs and sockets to lower molar and bicuspid piers.

Dr. H. A. Parr, New York (June 1890, p. 439), illustrates a vulcanite saddle-span bridge replaceable over fixed bars between cap-crowned piers. (See Figs. 53 and 54.)

Fig. 53.

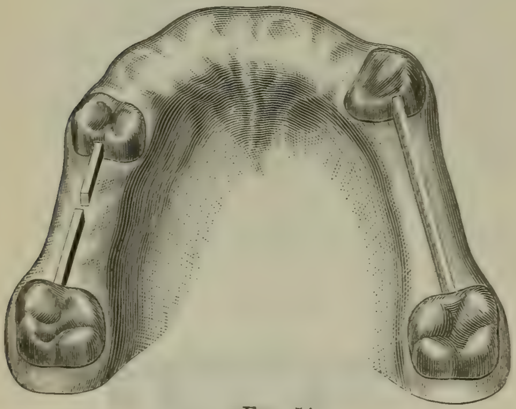
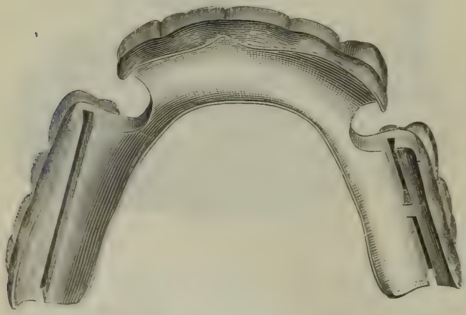
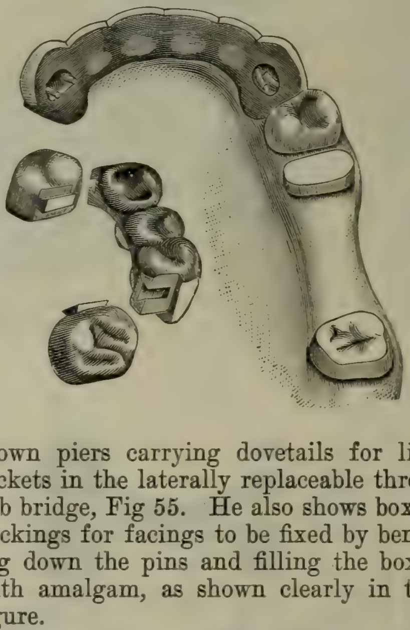


Fig. 54.



Dr. C. L. Alexander, Charlotte, N. C. (January 1891, p. 26), shows cap-crown piers carrying dovetails for like sockets in the laterally replaceable three-sub bridge, Fig 55. He also shows boxed backings for facings to be fixed by bending down the pins and filling the boxes with amalgam, as shown clearly in the figure.

Fig. 55.



Dr. C. L. Alexander, Charlotte, N. C. (December 1895, p. 1003), shows in Figs.

Fig. 56.

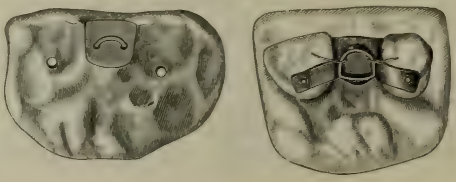
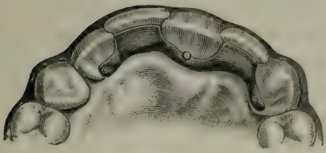


Fig. 57.



56 and 57 close-conforming subs having partial clasps hung on posts, or screws in the palatal parts of the live piers.

Dr. Emory A. Bryant, Washington, D. C. (March 1897, p. 217), illustrates in Figs. 58 and 59 his porcelain replaceable open-face crown, guide and clasp three-sub bridge.

Fig. 58.

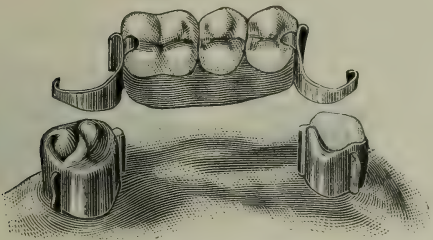
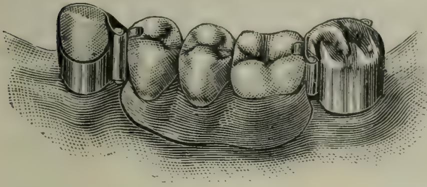
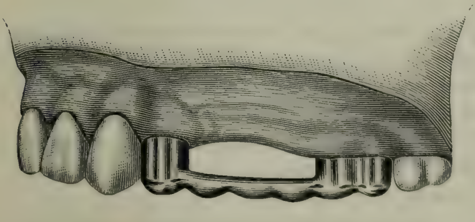


Fig. 59.



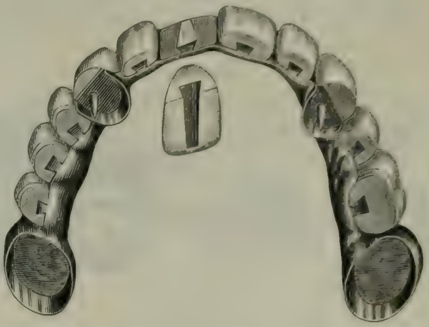
Dr. C. W. Stainton, Buffalo (March 1899, p. 279), shows in Fig. 60 "open position bridges," the spans of which are cusped stringers coupling the cap-crowns, which are either fixed or replaceable.

Fig. 60.



Dr. J. Leon Williams, London, Eng. (August 1900, p. 739), illustrates in Fig. 61 a Richmond bridge, the subs of which he says are "constructed with the new slotted teeth of which I have already spoken. All who are interested in bridge work should see the merits of these teeth at a glance."

Fig. 61.



Dr. A. W. Wimmer, Chicago (May 1901, p. 576), shows in Fig. 62 cap-

Fig. 62.

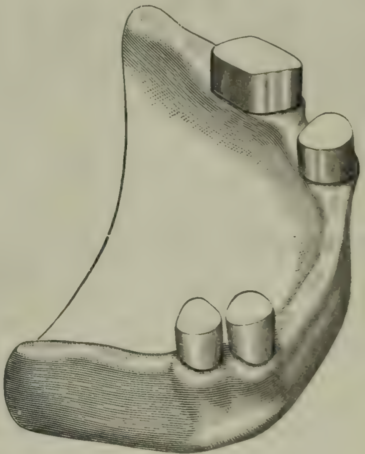
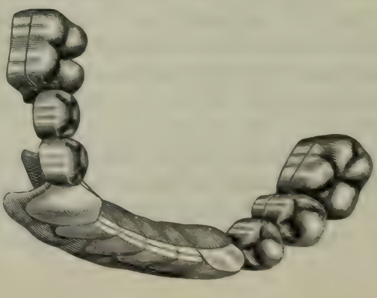


Fig. 63.



crowned piers for which telescoping cover-crowns were connected, and a saddle crown soldered to the second bicuspid cover-crown. The six anterior subs were mounted on a vulcanite saddle to form the replaceable bridge, Fig. 63.

Dr. G. W. Schwartz, Chicago (July 1902, p. 704), shows in Fig. 64 metal stringers between collar capped pier-posts which project to aid in the construction of porcelain sub or other structural bridge work.

Fig. 64.

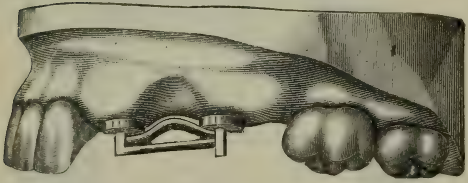
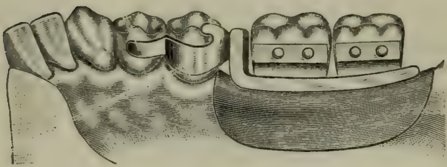


Fig. 65.



Dr. Joseph Head, Philadelphia (October 1902, p. 1009), illustrates in Figs. 65 and 66 a stop, clasp, and two-sub saddle replaceable bridge; also, in Fig. 67, a one-sub stop, saddle and clasp bridge—both of the baked body and porcelain gum class.

Fig. 66.

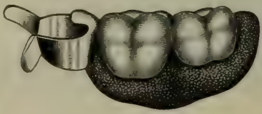


Fig. 67.

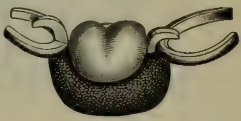


Fig. 68.

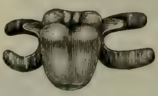
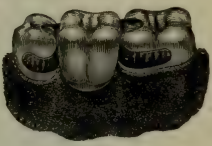


Fig. 69.



Dr. C. Frank Bliven, Worcester, Mass. (June 1903, p. 506), shows in Figs. 68 and 69 a one-sub with stops and clasps, forming a simple replaceable bridge on live piers.

THERE IS "AN IDEAL OCCLUSION OF THE TEETH IN THE HUMAN JAWS."

By MARTIN DEWEY, D.D.S., M.D.,
PROFESSOR OF ORTHODONTIA, KANSAS CITY DENTAL COLLEGE.

IN the January 1906 issue of the Dental Cosmos appears an article entitled "Is There an Ideal Occlusion of the Teeth in the Human Jaws?" As the article is in the nature of a question, my article will be in the nature of an answer.

That anyone today should question whether we have an ideal or normal occlusion of the teeth seems to me remarkable. Do we not have eyes placed in an ideal position in the face, and is not the nose placed in a normal position? In fact, wherever you observe the workings of nature, you see normal or ideal conditions and arrangements. Why, then, should nature not give us an ideal occlusion of the teeth?

I could in many ways show you that an ideal occlusion or normal occlusion of the teeth *does* exist. I will not advance any of the well-known and self-evident proofs which are apparent to any keen observer, but will show by certain facts and statements made by Dr. Wheeler himself in the article in question, that such is the case, and that we do have ideal occlusions still in this day and age of the world.

Dr. Wheeler, after having examined some 1500 skulls, takes exception to Dr. Thompson's statement that "There is a distinct type of tooth in the various tribes." Dr. Thompson's deductions were not made upon examination of only 1500 skulls, but after examining a great many hundreds of them.

We also find that the skulls which Dr. Wheeler has examined, according to his own statements, present the following characteristics: "Incisors and canines" "strike edge to edge and are worn down equally with bicuspids and molars;" "both outer and inner cusps worn down smooth and perfectly level." It follows then that Dr. Wheeler can be excused for not finding and noticing a type of tooth such as Dr. Thompson did, because Dr. Wheeler has not examined a great number of perfectly formed teeth. The teeth by being much worn would tend to obliterate the type. But why this excessive wear we are told about? It is answered in a few words: Because of an "ideal occlusion," of which I will speak later on.

The article also questions some of the teachings of the new school, and that would be expected, as though not owning the fact, it teems with the views of the old school of orthodontia. The teachings of the new school of orthodontia have long been and are still misunderstood by men of the old school for the reason that they have either not become familiar with Dr. Angle's teaching, or that some of the ideals of the new school have been beyond their reach. The article in question would make sport of some of these teachings in the following language: that the "particular appliance labeled for this and that type" can "be purchased by number and applied by rule." The reason so many men have never grasped the possibility of this teaching, although sadly misrepresented, is because they do not know the "rule," which rule is *normal occlusion.*

I do not know what Dr. Wheeler means by "two types." If he refers to "types" of malocclusion, he shows he is unfamiliar with the modern and scientific classification of malocclusion. If he refers to facial types, he again shows that he is unfamiliar with art as applied to modern orthodontia. The professor of art in the Angle School of Orthodontia, one of the best teachers of art in America, clearly shows that the human face today cannot be divided into two types and be treated from that standpoint either in art or orthodontia. The "modern prophets of orthodontia" recognize and know this teaching to be the fact, and treat cases accordingly. Art shows that there are many types of the face today. The one essential factor in obtaining the greatest amount of facial beauty in these various types, is that they be made to possess an "ideal occlusion of the teeth." Such are the demands of art today. The loss of any tooth, whether it be "anterior or posterior to the canines," will have its deleterious effect upon the facial lines of the individual regardless of whether he belong to one of "two types" or one of many.

In describing the occlusion of the skulls which Dr. Wheeler has examined, he says: "One condition which seems to prevail in all savage tribes, ancient and modern, *i.e.* the bite, instead of being according to the beautiful plaster casts so many of us have seen, with the incisors and canines of the maxilla overlapping those of the mandible, strike edge to edge, and are worn down equally with the molars." Does this not prove that there existed a normal occlusion of the teeth? Without an "ideal occlusion of the teeth in the human jaws" we should not have seen this uniform wear.

The normal occlusion of the teeth today is the same as it was in the savage, for if we have a normal or an "ideal" occlusion of the teeth today, and the teeth be subjected to sufficient use, we shall find they will wear down the same now as they did formerly. The length of the overbite of the superior incisors and canines is governed by the length of the buccal cusps of the molars and premolars. We find that in teeth which have a normal occlusion and are subjected to a great amount of wear, the incisors and canines are always worn down "equally with molars and premolars." The "incisors and canines of the maxilla overlapping those of the mandible" was the condition existing in the savage before the teeth had suffered so from use. Nature built the human denture after a plan whereby all the teeth would receive an equal amount of wear if given proper usage, and this proper usage can only result when we have an "ideal occlusion."

As the molars and premolars are worn down, the mandible must close farther forward, and travel a greater distance before the teeth occlude. The mandible traveling farther forward brings the edges of the incisors more nearly end to end, and wear results; so that by the time the molars and premolars are worn smooth we have the incisors worn down as well. In the savage the incisors and canines were used more than they are in man today, which also tended to cause them to become much worn. The fact that they were worn so smooth, proves beyond a doubt that there existed an ideal occlusion, and we have that ideal occlusion today.

If the savage had fallen into the hands of someone who would have attempted to improve his facial outline or dental apparatus by extraction, the condition which Dr. Wheeler describes would not be so universal, because normal occlusion would have been destroyed. The mention of the fact that the teeth are worn so smooth and even is the strongest proof that I could give of the existence of a normal or ideal occlusion, and Dr. Wheeler has given us that.

While the teeth of modern man may suffer from disuse because "our meat is softened in cold storage, and the cereals are ground," etc., yet this does not prove that malocclusion of the present day must be treated by the extraction of any of the teeth. Neither does it prove that modern man does not need an ideal occlusion any less than did the savage. Nor does a study of the evolution of the horse prove that the human family needs fewer teeth than it formerly possessed. It does not prove that nature is making mistakes today any more than she did in times past, and in times past they were very few—were so scarce that we have never found them.

Let us study for a few minutes the descent of the horse, and see how beautifully nature worked out her plans and always maintained an ideal occlusion. As conditions changed, the entire form and size of the ancestor of the horse changed,until we have the modern product. Likewise the teeth changed. We find that nature worked with a definite purpose, and made changes as they were needed. She did not produce many forms of malocclusion until she finally found the size, number, and shape of the teeth and their occlusion; instead, we find that a certain shape, size, and number present, and evolution was producing changes on some certain tooth or teeth, while the rest were not affected until the proper time. As these changes were taking place there always existed an ideal occlusion of the teeth of the horse family; and so also we always have an ideal occlusion of the teeth of man. If nature intends man to have fewer teeth than he now has, some teeth will be lost, and the positions of the remaining teeth will be such as to have an ideal occlusion during those changes. A large number of cases of malocclusion will not be produced, but everything will go on evenly and with a definite purpose. As the change from many to few or from few to many teeth has been worked out in lower animals, we can expect the same to take place in man if nature demands it, and that without the production of malocclusions or the destruction of occlusion.

That physical degeneracies should overthrow nature's plan of an ideal occlusion seems to me to be an idea without foundation, either theoretical or practical. The more a person is a physical degenerate, the more imperative it becomes that he possesses a normal occlusion, and we should do all in our power to give him as many of the normal things of life as possible. Malocclusion is not the result of degeneracy, for "Degeneracy never caused anything; degeneracy is the result of something." (Dr. Kirk.) Fever does not cause the disease, but the disease causes the fever.

The bringing together of "individuals whose ancestors have existed long under different environments" is also held by some men as a reason why we cannot have an ideal occlusion today. It is claimed that from such a condition the child may inherit the facial bones of one parent and the teeth of the other. Just how such a condition can be brought about they fail to show, and modern embryology fails to bear out such a statement. The embryo is a growth from the fertilized ovum, the growth of which takes place by the division of cells and the formation of new cells. As we follow this cell-division and formation of the embryonic membranes, we find it is impossible, up to a certain time, to say what cell will be used in the formation of the facial bones, and which will form the tooth. The facial bones, jaws, and teeth, with the exception of the enamel, are all derived from the same embryonic membrane; how, then, this inharmony, which is said to destroy all possibility of an ideal occlusion? If the child could be constructed from parts chosen from each parent, we might be excused for talking about malocclusions resulting from intermarriage of different races. Another thing which shows the weakness of such a theory as "the facial bones of one parent and the teeth of another" being present in a child is the fact that such conditions as are supposed to result from inharmonious inheritance are always reported in the permanent set of teeth. Dr. Angle has well said, "Is it not remarkable that nature should blunder in the relative sizes of the jaws and teeth in the permanent denture so often, and never commit this same blunder in the deciduous denture? Would it not be just as reasonable to expect it of her in the one set as in the other? and is not the evidence just as conclusive in the one case as in the other?" Indeed, the deciduous teeth would be more liable to be affected by such a condition than the permanent teeth, because they are formed and erupted before outside conditions have had much chance to act on the individual.

To advance the old theory of "large teeth and small jaws," even if in different words, is to me very foolish. And then to attempt to prove by it that an ideal occlusion does not exist is like a drowning man grasping at a straw. To claim that such cases as are supposed to result from intermarriage of races must be treated by extraction, and that nature makes such mistakes, may explain why some think that an ideal occlusion such as existed in the savage according to his type is different from what we see today. The fact that the teeth of the ancient and the modern savage show excessive wear of both the anterior and posterior teeth, only proves that an ideal or normal occlusion did exist, and was necessary for the proper use of the teeth from the standpoint of mastication. The loss of any of the teeth would have destroyed the occlusion and hindered the savage in the race of life, as well as have destroyed his facial type. The loss of any tooth in the human family today, even if the individual is supposed to be a specimen of physical degeneracy, will likewise destroy the ideal occlusion and facial beauty. The modern man today demands a normal occlusion as did the savage, from the standpoints both of use and of beauty. Nature intends he should have it, but the "odontocide" says, No.

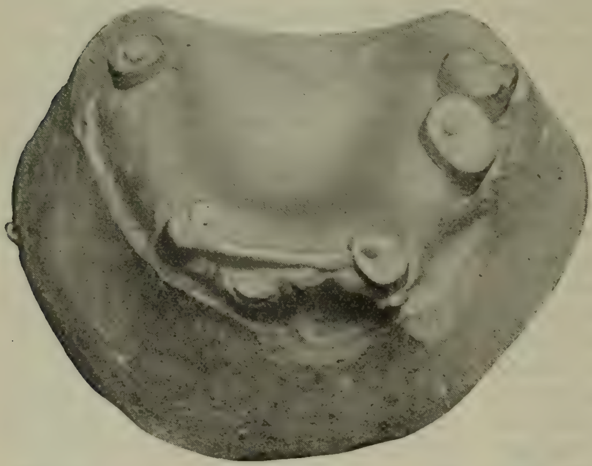
Study nature and her laws, "interpret nature's wishes," and you will see that there does exist an ideal or normal occlusion of the teeth in the human jaws.

CORRESPONDENCE.

ON THE "NEW METHOD OF REMOVABLE BRIDGE WORK."

To the Editor of the Dental Cosmos:

Dear Sir,—I have been interested in reading the paper by Dr. F. L. Fossume entitled "A New Method of Removable Bridge Work," as printed on page 1313 of the Dental Cosmos for November 1905. The author deserves great credit for working out this system, I am sure, and he will find cases where it will give the greatest satisfaction. I can speak from an experience of fourteen years.



Method of supporting a loose upper left canine. The upper right second molar, the upper left third molar, the supported left canine and the right canine were used as abutments for a bridge consisting of thirteen teeth.

In 1891 I saw Dr. J. T. Campbell using this system of supporting a weak tooth by a strong one, by this means being able to insert a removable bridge. Whether the idea originated with Dr. Campbell I do not know. I adopted it, and the cases in which I have made use of it prove it to be very serviceable.

I inclose a cast (see figure) showing the way in which I supported a loose upper left canine about ten years ago. I utilized the upper right second molar and the upper left third molar, besides the two canine roots, as abutments for the bridge, which carried thirteen teeth. I capped these four teeth and inserted screw posts through the flat tops and soldered to the caps. The cusps of the molars were on the removable bridge. I drilled four holes in the bridge to accommodate the posts, and made the bridge fast by four nuts. Of course, with this attachment, a second person would be necessary to remove the bridge. I have quite recently been obliged to do away with the bridge, as the third molar was about ready to fall out, and the other molar was quite loose.

As the upper left canine was very loose when I inserted the bridge, naturally I expected that it would be the first tooth to interfere with the usefulness of the apparatus, but to my surprise I found it—after nearly ten years—firmer than the day I attached it to the bridge.

I am firmly convinced that had I continued the platinum-iridium bar between the canines and the molars, the bridge would have done service for another five years, although the patient is nearly sixty.

This case is interesting, as it thoroughly demonstrates the value of the crossbar uniting the abutments.

Willard Hall, D.D.S.

London, January 31, 1906.

PROCEEDINGS OF SOCIETIES.

NATIONAL DENTAL ASSOCIATION.

(Continued from page 241.)

SECTION I: Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

Chairman—T. P. HINMAN, Atlanta, Ga.
Secretary—J. G. FIFE, Dallas, Tex.

THE first meeting of Section I of the National Dental Association was called to order by Dr. Thomas P. Hinman, chairman, on Tuesday afternoon, July 25th, in the Iroquois Hotel, Buffalo, N. Y.

The secretary, Dr. Fife, not being present, Dr. Hinman appointed Dr. J. H. Lorenz of Atlanta, Ga., as secretary *pro tem.*

The first order of business as announced by the chairman was the reading of a paper by Dr. H. H. JOHNSON, Macon, Ga., on "Thoughts on the Development of Crown and Bridge Work."

[This paper is printed in full at page 285 of the present issue of the COSMOS.]

Discussion.

Dr. C. W. RODGERS, Boston, Mass. In discussing this paper of Dr. Johnson's there are one or two little points with reference to the historical development of crown and bridge work that I wish to take exception to, particularly the statement that "crowns and bridges were crudely done up to 1875, and were not in general use as late as 1892," and particularly the last part of that statement. At the Fourth International Dental Congress Dr. Guerini exhibited samples of bridge work made more than two thousand years ago, and I have no doubt that crown and bridge work was practiced to a limited extent throughout the succeeding centuries. The earliest literature of much value was a work published by Pierre Fauchard in 1728, and in it he accurately described methods of crown and bridge work. Of course he was handicapped by not having porcelain at his command. From that time on occasional writers have mentioned methods of crowning teeth, as Robert Wooffendale in 1783, Benjamin James in 1814, and C. F. Delabarre in 1820.

In 1855 a distinct advance was made by Dr. Wm. H. Dwinelle, who published in the *American Journal of Dental Science* for April 1855, page 278, a method of making porcelain-faced crowns. In 1862 Dr. D. B. Wood published in the DENTAL COSMOS an article on "Enameling Plugs and Restoring the Contour of Defective Teeth by the Application of Enamel Caps." This article not only describes porcelain-covered platinum crowns, but also gold crowns and porcelain inlays.

Dr. Wm. H. Morrison, in the *Missouri Dental Journal* for May 1869 describes a gold crown made on a metal die. Other men to make improvements were Dr. C. E. Francis, DENTAL COSMOS, 1876; E. S. Talbot, *ibid.*, 1880.

In January 1887, before the First District Dental Society of New York, Dr. J. Rollo Knapp said: "Probably no single topic in the busy domain of dental art is today receiving so earnest and thoughtful attention of the profession at large as that of crown and bridge work."

In February 1887, before the Odontological Society of Philadelphia, Dr. A. G. Bennett said: "During the past decade there has been rapidly developed what may be properly called a third branch of dentistry. . . . practiced with varying degrees of success and failure, and has been advocated with almost all degrees of knowledge and prejudice. This new system, which is strictly speaking an old system revived and greatly improved, is called crown and bridge work."

In 1888 in an editorial, Dr. James W. White, at that time editor of the DENTAL COSMOS, said: "At many society gatherings there are now not only exhibited, but constructed and inserted on the spot in the presence of intelligent and eager observers, gold and porcelain crowns and dentures which exemplify in a most practical way an expertness in constructive and manipulative ability worthy of enthusiastic commendation."

In 1887, before the First District Dental Society of New York, Dr. George Evans said: "Unquestionably the most notable artistic advance in dentistry of late years is crown and bridge work. In my judgment this department of our work has reached a stage of development clearly entitling it to rank as a specialty of dentistry."

I think that the foregoing proves that crown and bridge work was in general use during that time, and I feel that a large share of the credit for the development of such work is due to the men who did it between the years 1878 and 1890. If you will look up their work in the literature on the subject, you will find volumes dealing with all the possible phases of crown and bridge work. There are a number of articles written by Dr. W. Storer How, a most prolific writer and one who has given to the profession many good ideas; by Dr. Marshall Webb, and by Dr. Wilbur F. Litch; and a long list of men might be mentioned who have done a great deal toward the development of this phase of prosthetic dentistry.

Let me quote a little more fully from Dr. E. Parmly Brown in the statement referred to by the essayist. In 1892, Dr. E. Parmly Brown, speaking of crowns and bridges, said: "I think I can safely say that while not one-quarter of the members of the First District Dental Society today are furnishing their patients with bridges, there are bright men all over the land, from the Atlantic to the Pacific, from New Orleans to Canada, who are doing it. The other day I was speaking to a member of this society who said: 'Yes, I am making bridges now, and I am making money at it too, as the people will have them.' The people know what advanced dentistry is. He had either to make bridges or lose business." Speaking for himself, Dr. E. Parmly Brown said that in eight years he had put in a thousand cases with but twenty-five failures.

I wished to make these remarks on the subject of crown and bridge work to take exception to what Dr. Johnson said, that they "were not in general use as late as 1892." I feel that great credit is due to the men who worked previously to that time. The improvements made since then have been merely improvements with reference to details.

With reference to Dr. Johnson's illustrations, I think he has presented a valuable method, and a good addition to what we have in the methods of manipulation of crowns as abutments for bridges. I like Dr. M. C. Tracy's method of preparing the root. He says the root is beveled toward the labial and palatal surfaces and also at the approximal sides, leaving a narrow floor at the center of the root. The foundation is swaged in No. 30 gage platinum, which forms a seat of great strength around which to construct the crown. The post is made of iridio-platinum wire, and is allowed to extend below the plate for the attachment of the facing. The crown is contoured with any of the high-fusing bodies and finished with low-fusing porcelain.

Dr. C. J. GRIEVES, Baltimore, Md. Mr. Chairman and gentlemen of the section: Since Dr. Rodgers has covered the historical, I will simply touch on the practical side of the question. After receiving this paper some weeks ago, in order that I might more intelligently discuss it. I made six or eight of these devices, and I have to say that I want to present my compliments to Dr. Johnson or to any man who makes an effort to take the crown out of the laboratory and make it a feature of operative dentistry. This method is one of the few where thin gold is burnished against the tissues, not on a cast of an imperfect impression, but directly against the root, following largely the methods of operative dentistry and on the lines of cast fillings.

I think that crown and bridge work, generally speaking, was from the start unfortunate in having been consigned to the laboratory and labeled mechanical dentistry. I would insist on the idea that the fitting of the band and the adaptation of the cap is operative dentistry—something to be done at the chair. The ready-made crown, the crown and bridge made while you wait, and then stuck in the mouth, are doing crown and bridge work more harm than anything else today.

The discussion of the practical side of this paper resolves itself into bands fitted cervically, because the essayist is trying here to do away with bands, in favor of plates of metal thin or otherwise, swaged or burnished directly to the root-surface. Now, there can be no difference between irritation produced in the gingival tissues by a metal band extending vertically along the long axis of the tooth, and that by one extending laterally. Both produce gingivitis if badly done, and both will succeed if done correctly. The great fault with the band lies in the fact that it is hurriedly adapted, sufficient time not being allowed for the teasing back of the gingival tissues. The gold band is fitted and the root prepared with as much care as is ordinarily applied to cavity preparation, but the adaptation of the band to the root is not carried out with the same amount of care.

If, for instance, the time spent on the band were given to shaping the root walls, pushing back the gingival margins, as much tissue as possible being exposed, so that we may not be fitting the band in the dark, the results with the band would be quite as satisfactory and pleasing, and I think much more substantial. A very prominent porcelain worker, speaking of bands, said that the fitting of the band under the gum was much like a man drawing a pig with his eyes shut. I venture to say that the gentleman never, except by chance, made a band intelligently where he had not first pushed back the gingival tissues, and we need not expect success unless we do that, any more than in a large filling cervically seated where the soft tissues are not forced away from the cavity.

Personally, in regard to crowns, I prefer the sentiment voiced not long ago in a meeting where the speaker said that it was quite a reflection on the dental profession if, after twenty-five years' use of the banded crowns, they could not fit a band to the root of a tooth without serious sequelæ to the gingival tissues, when for years the general surgeon has been placing silver plates after brain surgery. This appliance is beautiful where the tissue has receded labially, but for practical crown and bridge work I am not ready to say good-by to the band. We should be a little more consistent in condemning bands, for the band fitted posteriorly can do just as much harm to the tissues as the band fitted anteriorly, and there are those who denounce all bands, being ready to say that they eschew the making of all jackets, shells, etc., and who place their dependence for mechanical support posteriorly on the root, plates, and posts in crown and bridge work. Then and only then will they be honest in condemning bands.

In making these appliances I have in some cases met with fair results, and in others not so good, but I attribute that to my faulty technique, and I wish Dr. Johnson were here to enlighten us on one or two points. One or two things happened to me: In the first place it was not so easy to adjust the pure gold to that projecting hump on the palatal side as it seems to appear from the drawing, and after fitting the cap and flowing the solder, I found little inequalities in the solder, which, being thinner than the other parts, split in forcing the cap into position, and may have been due to my defective skill in burnishing. Again, in using the crown as an abutment in a bridge, it was found very difficult in soldering to keep the solder from flowing from the cap toward the mass in the bridge, which was naturally the hottest, and when the bridge was taken out of the fire there was nothing left on the cap but the thin, pure gold.

Now, I compliment Dr. Johnson on giving us a new idea, and I trust it will be developed, particularly the adaptation of the thin gold to the root simulating the cast filling of Dr. Alexander's, and along the lines of operative dentistry generally. I think these crowns have their place, but I repeat that I am not ready to part with the banded crown in bridge work, for I believe the difficulty with the band is corrected by pushing back the gingival tissues and making a half-banded crown, adapting the pure gold directly to the root and reinforcing it with solder to cervical contour, and I hope we may yet come to some such method in crown and bridge work.

Dr. C. CARROLL, Buffalo. The essayist said nothing in his paper as to whether he tips the backings of his teeth with gold, but I would like to ask him if he does it, and if not, whether he has any difficulty with broken-off facings?

Dr. R. M. SANGER, East Orange, N. J. Of course I cannot discuss Dr. Johnson's particular method, as I have never made a crown after his method. I devised a half-collar crown embodying some probable advantages over the full-banded crown, constructed with No. 32-gage gold and I think having some advantages over this crown in the ease of making and the ease of adaptation. In my opinion the half-collar crown properly constructed and made has advantages over the full-collar crown in its esthetic points—the concealment of the gold which to my mind is a decided advantage—while I think the half-collar properly fitted will give all the strength that the full-collar crown will give. I think our error in using the full-collar crown is in attempting to make the collars too deep. It is a mistake in my opinion to suppose that a collar of one-thirty-second of an inch in width is not as strong as the collar one-sixteenth of an inch in width. If the band encircles the root, I do not think the depth is essential, providing it goes far enough under the gum to give it the proper hold. It is in my opinion a mistake to think that the deeper the collar the better the crown will be. Again, the half-collar crown has an advantage in bridge attachments in that it gives an esthetic effect. It gives the same appearance as the all-porcelain crown, and at the same time it has a gold back to which other teeth can be attached. This cannot be done so readily with the porcelain crown unless it be in the case of an all-porcelain bridge.

In the matter of the history, I would like to say one word with regard to Dr. E. Parmly Brown. The essayist passed over this portion very briefly, but I have always thought that to him was due the credit for devising the all-porcelain bridge, and indeed I do not think Dr. Brown's method for constructing that bridge has been improved upon to any marked degree. I want to pay him that tribute, because I know that he is a very skilful man and is doing a great deal of good work along that line.

In regard to the tipping of the teeth with gold, I have not found that a necessity, if proper attention be paid to the occlusion. I have not been in the habit of putting these tips on porcelain crowns, and I do not think that I have a greater number of split facings than the men who tip their facings.

Dr. W. G. MASON, Tampa, Fla. I have made one crown after Dr. Johnson's idea. I had to crown a lateral incisor which had broken, splitting off a part of the root under the gum margin on the lateral surface, making it next to impossible to use a band. While I did not follow Dr. Johnson's idea exactly, it was virtually the same thing. After preparing the root, I burnished a piece of platinum over the end of it, allowed it to extend over the palatal surface, and burnished it well down around the root, just under the gum margin. The pin was then placed on the root, the cap was reburnished, the matrix reinforced with solder, and the crown finished in the usual way. I am much pleased with the crown, and think the idea a capital one.

Dr. R. M. Sanger. Dr. Grieves has asked me to speak of the method of fitting bands which I followed for a number of years; that is, the dissecting away of the gingivæ where I found it closely attached. It has been my practice to take the scalpel and under cocain to dissect away the tissue around the root to the depth of the band. The tissues are then cauterized with trichloracetic acid, thus causing a clean, dry eschar which forms practically a new attachment to the gum, and does away with all possible source of irritation.

The subject was on motion passed, Dr. Johnson not being present to close the discussion.

The next order of business as announced by the chairman was a paper by Dr. Harold DeWitt Cross, Boston, Mass., on "Normal Articulation of Artificial Teeth," as follows:

Normal Articulation of Artificial Teeth.

The purpose of this paper is to very briefly describe normal or anatomical articulation—which, in a word, is duplicating in artificial teeth certain conditions present in the arrangement of the natural organs. In this artificial normal arrangement there is no feature which is not a copy of the natural teeth, either in the shape of the individual teeth, or in their relations one to the other.

The features of the natural teeth which should be copied in making a normal arrangement of artificial ones are: the compensating curve; the sharp cusps and deep fissures; the inclination of the molars; the low palatal and high buccal cusps of the molars, and a normal occlusion. The compensating curve is for the purpose of equalizing the articulation during the forward and lateral motions of the mandible, when the condyles move forward and ride on the articular eminence. This permits of a balance on the passive side and is needed because the condyle path is at an angle to the plane of occlusion. The sharp cusps pass more readily through tough foods, hold the food, and permit of a proper overbite of the anterior teeth.

The inclination of the molars and the long inferior buccal and superior palatal cusps assist in balancing the articulation, and permit of direct force being applied during the lateral masticating motion. The location of the fissures and the arrangement of a sharp and blunt cusp oppositely set in the maxilla and mandible, provides for a sharp one bearing on a blunt one during mastication. The normal occlusion, which is so essential, is a summing-up of all that goes to make a normal articulation, and if the occlusion be correct in every detail the articulation will also be right.

The terms occlusion and articulation should be understood thoroughly, as they are frequently used synonomously. Occlusion signifies rest, a passive condition when the condyles are in their sockets and the teeth locked by the bite, the upper third molars being in contact with only one opposing tooth, and the lower incisors underbiting but not in contact with the upper. Articulation, on the contrary, expresses motion and is an active condition. It includes all the positions which the teeth may assume during any of the movements of the mandible. The state of occlusion requires no further description, but it will be necessary to describe the articulation more in detail. The usual motion during mastication is a lateral grinding one. The condyle on the active side—or that in which mastication is being carried out—rests and rotates or moves forward very slightly, while the one on the passive side glides forward on to the eminence. This brings the teeth on the active side into contact, the lower buccal with the upper buccal cusps, and the lingual likewise, so that there is contact of every cusp of the molars and bicuspids on the active side. This contact may extend forward as far as the incisors in cases where there is very little overbite. The passive or balancing side has only one point of contact, and that is between the buccal cusps of the lower first and the palatal cusp of the upper second molar. When the teeth are in the incising position the condyles are both forward on the eminence, and there is contact between the buccal cusps of the molars and also of the incisors.

To set up teeth to a normal occlusion and articulation, it is essential that an articulator be used which accurately reproduces the movements of the mandible; also that some provision be made to adjust the casts on it so that they may bear the proper relation not only to each other, but also to the condyles and to the path of the condyle. Teeth set up in an articulator, properly adjusted, will occlude and articulate in the mouth just as on the articulator.

By the use of the face-bow one may secure the exact relation of the plates to the condyles and their path for transference to the anatomical articulator. This has nothing to do with the taking of the occlusion, which is previously done in the usual manner. In setting up the teeth the upper should be first put in place, beginning at the median line, then the lower second bicuspids and molars alternately on each side, and lastly the first bicuspids, canines, and incisors. This order secures a correct occlusion even if the teeth are not properly matched in the set, and trying the articulation as each tooth is put in place insures the normal articulation. Nearly all sets of twenty-eights as put up by the manufacturer are improperly matched the lower with the upper, and as many are made for a very short or edge-to-edge bite, it is frequently necessary to narrow the lower incisors in order to get them in place. A careful selection may avoid this in many instances.

Usually it is best to select teeth with a fairly long bite, as the natural teeth have a normal overbite of about one-eighth of an inch. Before setting up any of the teeth, a deep square fissure should be ground in each bicuspid and molar, excepting the lower first bicuspid; the fissure should be near the buccal side in the upper and near the lingual side in the lower. This can best be done with a carborundum wheel of three inches in diameter and one-half inch in thickness. If it be desired to put in the transverse fissures, they may be made to some degree of accuracy by means of small thin engine stones. This method of arranging the teeth applies not only to entire upper and lower plates, but also to single and partial dentures. For partials it is not always possible to obtain an absolutely normal articulation in every particular, owing to an original faulty occlusion or to changes due to extraction, but it is possible and practical to employ the sharp cusps and to obtain a good masticating contact on one side, and some sort of a balance on the other, even in very unpromising cases.

Teeth arranged on these principles will cut, hold, and grind food very much better than the old style of smooth cusps, and permit one to masticate his food almost as readily as with the natural teeth. Of course it is essential that the plates fit the mouth just as well as possible, otherwise there will be no advantage in securing a normal arrangement. Normal articulation is not devised because dentures are not or cannot be made to fit, but the essential idea is to make the substitute for the natural organs as nearly like them as possible, and to permit of the natural use of the mandible in its lateral movements, which is an impossibility when the old hinge articulators are used.

It is impossible for one to wear teeth having deep fissures arranged in a plane-line or hinge articulator, because the long cusps will catch and interlock in such a manner as to dislodge the plate immediately. This is probably the reason why the artificial teeth are now made without cusps, the latter being substituted by little smooth hunches which cannot catch, and which are not of the slightest value in masticating.

With dentures made with a normal articulation one is able to incise or to masticate any ordinary food with no liability of the plates being dislodged, as there is a contact of at least three points in any position of the mandible during incising or masticating. Of course, if one attempt to bite a lead pencil or other similarly hard substance, there can be no balancing contact, and all that will prevent the denture from tipping will be its fit, and for this particular purpose normal articulation is no better than the plane-line arrangement. But with articles of food it is different, for even substances like tough meats are quickly pierced by the sharp cusps, and portions of the food are pressed into the deep fissures and interspaces, allowing of an almost instant contact of the cusps, giving a balance, and after contact is once established there can be no tipping, as the contact continues till the teeth are in occlusion.

The path of the condyle has been found to be normally about thirty degrees, although there is considerable variation in different individuals. This has been determined practically by measurements and tracings on the outside of the face. Theoretically, in the perfectly normal condition, the path of the condyle will follow a line starting at the highest point of the condyle and cutting the articular eminence at its lowest point. This line will also pass through the cutting edges of both the lower and upper incisors. This principle is made use of in setting the casts in the articulator, and gives a slightly varying angle for each case. The direction of the slot in the articulator represents the path of the condyle, and the casts should be set so that the prolongation of this slot will pass through the portion of the wax of the occlusion plates which will be later occupied by the cutting edges of the lower and upper central incisors.

One of the advantages to be derived from the use of the face-bow articulator is that the casts when they are set on the articulator are hinged on the same radius that the mandible is, with the result that if the bite is opened or closed the relations existing between the two casts remains the same.

In setting up teeth to a normal articulation, one must to a certain extent estimate the compensating curve, because there is no very practical manner of absolutely determining it. Theoretically, however, the angle of the condyle path determines the overbite and front bite; while the overbite, in turn, determines the compensating curve and the length of the cusps. Thus, with a considerable angle of the condyle path and a long overbite there must be quite a distinct compensating curve, deep fissures, and considerable of a front bite, while there might be present in another case the same angle of the condyle path with only a slight overbite, very little front bite, and but slight compensating curve. The angle of the condyle path, the overbite, front bite, and compensating curve are all closely related and dependent on one another, so that one soon learns from experience just what amount to give to each.

Discussion.

Dr. C. W. Rodgers, Boston, Mass. Dr. Cross read a paper before the Massachusetts State Society in which he reported some very interesting experiments carried on by him with several plates with artificial teeth attached. Dr. Cross made full upper and crown plates, using the ordinary articulator, for a gentleman who was at the time a student in medicine. The gentleman wore the plates for several years, and Dr. Cross then made him full upper and lower plates, using the face-bow and anatomical articulator, setting up the teeth with the compensating curve. This gentleman, being a student of medicine, became very much interested in the masticatory value of the new plates, and he performed a number of experiments with them as compared with the old. He found in using the new plates that he was able to crush such foods as peanuts, Scotch bread (being of Scotch descent he liked what is called the Scotch loaf), etc., masticate them thoroughly, and get them ready for swallowing with a less number of chews than were necessary with the old plates. This proved the great value of artificial teeth when set up with the assistance of the anatomical articulator.

The question then arose as to the value

of smooth grinding surfaces as compared with the deep sulci and long cusps; whether the teeth set up on the anatomical articulator, using a smooth surface, would not be better for grinding than the deep sulci and long cusps. Dr. Cross then took the trouble to make another set of plates using the smooth grinding surfaces. Experiments were performed with these teeth to test the masticatory value, but it was found that the long cusps were much better for masticating foods.

The gentleman for whom the plates were made, and who is now a medical practitioner, has become very much impressed with the value of artificial teeth set up by this advanced method which the essayist advocates. I think Dr. Cross is doing a great deal of good work, and coming in contact, as he does, with so many young students, he has the opportunity of thoroughly teaching them the value of setting up the teeth so as to get the best possible results, and this in time will be of great benefit to our profession.

Dr. G. H. **Wilson**, Cleveland, Ohio. Any effort in the direction of improving the articulation of artificial dentures is commendable, and must result in good.

Do we appreciate the conditions that must be met in articulating artificial teeth? The patient necessarily applies force against the artificial plate at angles different from what he would with his natural teeth. This is because we have a changed relation of the relative position of the maxilla and mandible as the result of resorption of the alveolar processes. We find in nature that in ninety-five per cent. of all cases the buccal cusps and incisive edges overlap the lower teeth; and when the mouth is forcibly closed the force acts in the direction of the long axis of the bicuspids and molars and not laterally. So far as holding the natural teeth in place, in simple occlusion, no matter how great the force the roots are not necessary, because the crowns set directly over the alveolar processes—that is, upon the fulcrum—and there is no leverage to displace them. When the teeth have been extracted and resorption is complete there is a great change in the relation of the fulcra—that is, the summits of the alveolar processes. When the resorption is complete we find that there is a considerably greater distance between the summits of the alveolar ridge of the mandible in the location of the second molars because the process recedes downward and outward. In the maxilla the process recedes upward and inward. In view of these conditions, if we set the artificial teeth directly over the summit of the alveolar ridges we will have the buccal cusps of the upper teeth setting inside of the buccal cusps of the lower teeth. For this reason we have so many and varied mechanical problems to solve.

It seems to me that because of these changed conditions and the laws of leverage that must be considered, we do not and cannot reproduce the exact anatomical articulation as nature designed it for the individual. I doubt if any of us sets the artificial teeth exactly in the position occupied by the natural ones, but we modify our so-called anatomical arrangement according to the existing conditions, thereby demonstrating our appreciation of the scientific requirements of the case in hand.

There is no question that the face-bow is a valuable instrument in teaching and demonstrating certain principles, but I doubt the necessity of its use where the lessons have been well learned.

The matter of deep cusps is a little overdrawn, it seems to me.

There is no question in my mind but that the more we study anatomical relations and articulation, the better workmen we shall become.

Dr. N. S. **Hoff**, Ann Arbor, Mich. I am very much interested in the subject of the occlusion of the teeth, and I think there is nothing in the construction of artificial dentures in which we are so lame as in the matter of the proper occlusion of the teeth. I have had this subject brought very forcibly to my notice in the study that I have been giving to orthodontia—the importance of occlusion both in orthodontia and otherwise—and I believe it is only now that we are waking up to the importance of this subject.

It is surprising to one making a study of orthodontia to know the number of cases of malocclusion that one encounters in daily practice. There is hardly one case in a dozen, and perhaps I might say one case in fifty, where the teeth are in perfect occlusal relation to each other. When we find that conditions are as enumerated, and further, that people with dentures in malocclusion are very successful in the mastication of their food, we possibly are led to think that we can carry the same ideas into artificial dentures, but here we encounter such conditions as Dr. Wilson referred to in his remarks, conditions dissimilar from what occurs in the case of natural dentures. We cannot expect to secure suction or adhesion of the artificial dentures to the supporting tissues sufficient to justify us in neglecting the matter of the function of occlusion as related to the question of artificial dentures.

We do not give sufficient attention to the subject of obtaining the proper relation of the jaws. We will have to study the problem of the proper relations of the jaws in order to secure an occlusion not only as near as possible to the natural occlusion, but likewise to produce a harmonious result. It should be the part of the prosthodontist to secure harmony, and also to set the teeth in such relations that the patient will be best enabled to use them in the mastication of food. If we should make as careful a study of the occlusion of the artificial teeth as Dr. Angle has done of the natural teeth, we might establish some definite rules on the construction of artificial dentures, and we shall have made a great advance in the study of prosthetic dentistry. This is a subject which it seems to me needs to be studied more carefully than any other subject in the realm of prosthodontia. We blame the manufacturers for the faulty occlusion of their artificial teeth, but I believe it is more often the fault of the dentist rather than that of the manufacturer. These teeth come to us in fairly good condition, but need to be manipulated before an ideal result can be secured.

Dr. M. T. WATSON, Detroit, Mich. Dr. Hoff's remarks a moment ago, in speaking of occlusion in relation to orthodontia, brought this thought to me—that practitioners who are doing prosthetic work are called upon to do even finer work, for you have to produce the finished occlusion with every tooth perfectly "seated," as the mechanic would express it. If you fail in this and allow a single tooth to strike too hard, the fit and usefulness of your plate is destroyed. In orthodontia we must establish the normal relations mesio-distally and bucco-lingually, but the fact that a tooth has been slightly elongated or that it is not quite long enough is a source of little concern to us, as the natural forces usually take care of such a condition.

Dr. G. H. WILSON. Dr. Hoff's remarks brought the thought to my mind that we rarely have normal conditions to restore. There are two reasons for this: first, because the early extraction of one tooth or more, interferes with the normal development of the jaws; and second, because diseased conditions of the mouth in later life may have produced marked changes in the arrangement of the teeth and contiguous structures, so much so that the patient and friends may often have an erroneous idea of the natural or normal.

It is the prosthetist's duty to form a conception of how nature intended the dental organs to be, to know what the acquired features were, and then to harmonize the artificial denture with its environments.

We can learn much from our orthodontist friends.

Dr. CROSS (closing the discussion). The feature of leverage of artificial dentures has been spoken of; namely, that if the teeth are set on the ridge the occlusion would not be normal, but would bring about opposite conditions, the upper striking inside the lower, and if placed in normal occlusion the teeth would be outside the ridge. I find that such an obstacle is very readily overcome by following, as in all branches of this work, the conditions of the natural teeth. In the natural teeth the bicuspids somewhat and the molars to quite an extent tip outward—the condition which I designated in the paper as the inclination of the molars. There is an inward sweep from the lingual aspect of the lower first or second molar, and a line drawn from that will not touch the gum tissue. The lower molars are inclined lingually, and the upper molars buccally, and if that same condition be preserved in making artificial dentures the occlusion will be normal, and if these teeth are set over the ridge the direction of the force in mastication will be along the long axis of both of these teeth. I follow out the idea of setting the teeth over the ridge, even including the lower incisors, and when carrying out this idea a very marked underbite, a front bite, or whatever may be desired can thus be obtained. There is quite a distinct space naturally between the lower and upper incisors.

In regard to the grinding of deep fissures in teeth, I did not wish to be understood as carrying it to an extreme, yet I believe in deep fissures and sharp cusps. If you will take a cast of an upper set of natural teeth, and look at the teeth, inverting the cast so that the teeth will be projecting upward, and "sight" along the fissures of the molars, in almost every case except where the cusps are worn down greatly, I think you will be surprised at the depth of the fissures and the sharpness of the cusps. I believe in sharp fissures and sharp cusps, because with artificial dentures we have less force to apply than in the natural teeth. The force is greatly lessened; it is brought down perhaps from two hundred pounds of available force in the natural teeth to possibly forty pounds in the artificial teeth, and we want in a measure to compensate for that loss in the artificial teeth.

In addition to that there is the question of the instability of dentures—and unless the teeth have fairly sharp cusps we cannot restore the function of mastication to the extent possible. I believe of course in aging the anterior teeth to suit the individual cases, and I do believe in getting sharp cusps for mastication. If one were to put new teeth in a coffee mill, he would put in good sharp teeth and not smooth ones.

In regard to the manufacturers, while there is yet room for improvement in the manufacture of artificial teeth, those which are obtainable at present are better than we sometimes think, and it lies wholly with the dentist whether there shall be any improvement made or not. For the last year or so I have been in communication with the representative of one of the largest manufacturing concerns in the country, and while he admitted that it would be convenient to have teeth made according to natural molds, he simply says that there is not a sufficient demand for them. He said also that when a demand is created for such teeth the manufacturers will supply them, as they were in business for financial reasons, but at present they had to make teeth of the kind that the majority of dentists use.

One of the speakers expressed in different words Dr. Bonwill's idea when he made the statement that "he could articulate the teeth better than God Almighty." It is necessary for the artificial teeth to be better articulated than the natural teeth, because of the adverse circumstances under which they are to be used.

Another speaker brought out the idea of orthondontia in regard to the articulation of artificial teeth, and in replying to him my remarks will apply also to the statement by Dr. Wilson, that because of the jaws being undeveloped it is very nearly impossible that the artificial teeth should restore the natural conditions. Now, I believe this to be possible, and the work of the orthodontist goes a good way toward proving that such a thing is not only possible but feasible. They take undeveloped jaws and restore them to natural conditions, and therefore I believe that it is possible to reproduce almost the normal conditions in all cases requiring artificial dentures.

On motion the subject was passed and the meeting adjourned until the evening session, at 8 o'clock.

FIRST DAY—*Evening Session.*

Section I was called to order at 8 o'clock Tuesday evening, July 25th, by the chairman, Dr. T. P. Hinman.

The first order of business was the reading of a paper by Dr. CALVIN S. CASE, Chicago, Ill., on "Open- and Close-Bite Malocclusion."

[This paper was printed in full at page 1401 of the DENTAL COSMOS for December 1905.]

Discussion.

Dr. S. H. GUILFORD, Philadelphia, Pa. I think we have all been entertained and instructed by Dr. Case's paper, which has been made more intelligible by the illustrations thrown upon the screen. I agree with very much of what he has said, yet on some points I disagree with him.

In the first place I object to some of his terminology. At times he spoke about open-bite occlusion, and at other times of open-bite malocclusion. It seems to me that this is incorrect, because while the word occlusion is an excellent word, it means a coming together. Teeth are only in occlusion when they do come together. If they come together improperly and irregularly we have malocclusion, but when they do not come together we have "non-occlusion." Therefore when we find non-occlusion in the anterior part of the mouth, it should be called anterior non-occlusion. We cannot have a bite in the proper sense without contact, and we cannot have occlusion without contact. His terms remind me of an individual who was asked to define Christian science, and he answered that in the first place it was not Christian, and in the second place it was not science. And so when we use words to express certain conditions we should have them as nearly right as possible.

In regard to the cases of anterior non-occlusion, Dr. Case describes the influences that bring about these conditions, and his explanation to a certain extent seems plausible. He tells us first of all that it is largely due to mouth-breathing, because in mouth-breathing we have a contraction of the muscles. On the one hand, he said, we had a fulcrum at the temporo-maxillary joint, and then we have the action of the masseter muscle drawing upward and the action of the hyoid muscle drawing downward. That would seem to be a good mechanical explanation, because when we have a point of this kind [illustrating a lever of the third class] and exert the pressure in the middle, we might have the condition he spoke of—the bending of the bone. But the question arises, Does that take place? Probably we are all familiar with the story told us in childhood about a king who called into his presence a number of scientists and asked them to explain why it was that when a glass was entirely filled with water so that another drop would cause it to overflow, if one dropped a gold sovereign into the glass it would not overflow. One of the scientists tried t explain why it would not overflow; and then another took it up and tried to explain it in his way. While this was going on one of the scientists slipped into an adjoining room, tried the experiment and found that it did overflow. When he was asked why it would not overflow he said that it would, because he had tried it. The king commended that man; he did not want them simply to accept anything that he or anyone else said; they should not attempt to explain anything unless they knew that it did occur. Now, the question is, Does this condition occur in the case of the jaw as Dr. Case has explained? It would seem so at first sight, but what takes place when a person is asleep? Why do the eyelids close? Is it due to muscular contraction or to the relaxation of the muscles which in conjunction with the attraction of gravitation causes the eyelids to fall? Also, why is it that when an individual falls asleep the mouth will gently open? Is that due to the action of the hyoid muscle drawing the jaw down or to the relaxation of the masseter muscle? Is it not due to the fact that all of the muscles are relaxed for the time being? If the masseter muscle is acting with the mouth open, does the hyoid muscle counteract that? No, because both of these muscles are in a state of rest. What probably is the cause of this anterior non-occlusion, or to what is it most likely due? I believe it is due to lack of development in the anterior part of the jaws. We know that the alveolar process forms around the roots of growing teeth, and that as the roots develop the process increases in height. If there be an arrest of development, and the teeth do not become fully extruded, there is no necessity for the alveolar process to continue its development and it does not do so.

Now as to the treatment. If the lack of occlusion in front be not very great, and if the features have not been affected unfavorably by the condition, the best thing I know of is to extrude the upper and lower teeth. This can be done without much difficulty; but while it is not difficult to force the teeth out of their sockets it is very difficult to hold them there until new material is formed around them sufficiently to resist the strain of mastication, and that is where the trouble lies. But suppose there is a great lack of occlusion. While a child is young you can exert pressure on the chin and gradually force it up until the anterior teeth come into occlusion. In doing so you will have tilted the condyle somewhat out of the glenoid fossa, but that will adjust itself in time. If cases be taken early enough there is no reason why great improvement should not be made. If, however, the case comes to us later in life, when we cannot hope to make any anatomical changes, and if the lack of anterior occlusion is considerable, what are we to do? Under these circumstances there is but one thing that we can do; namely, grind off some of the molar teeth, preferably the upper ones. The operation may be somewhat painful, but the pain can be lessened by an obtundent. If you have to grind much it may be necessary to devitalize one or more of the teeth, after which one can continue grinding until a considerable improvement results. You may not get all the improvement you want, but you can get a great deal. I do not think anyone who practices orthodontia would tell a patient that he could bring about a perfect occlusion in the anterior part of the mouth in these cases; all we can do is to improve the condition. Some practitioners are opposed to grinding the teeth and devitalizing them, while others go even farther. Dr. Jackson suggests extraction in certain cases, and in extreme cases resecting some of the alveolar process, afterward putting in a plate for the lower teeth to bite upon. That seems like extreme practice, and yet sometimes we have to resort to radical methods, just as a surgeon does. The main thing to do is to use our judgment in bringing about the best results.

In the other condition which Dr. Case speaks of, and which I would describe as extreme overbite, we have an excessive overlapping of the upper anterior teeth. What is the cause of it? I think it is due to one of two causes. Either, for some reason or other, the posterior teeth in the course of their eruption may have failed to come down to their proper length so as to establish contact between the upper and lower ones, or there may have been an excessive development of alveolar tissue in the upper anterior region. I believe the condition is most frequently due to the lack of full eruption on the part of the molar teeth. Where there is not this shortening of the molars, and sometimes where there is, we find the lower incisors considerably extruded above the normal occlusion plane. In connection with this we not only have the excessive overbite of the upper incisors, but also their protrusion. In cases of this kind two things are necessary. First, we must get rid of the interference which exists in the lower incisors; they must be pressed down in the alveolus farther than they are. If this be not done it would be impossible to move the upper incisors back. Next, the posterior teeth must be extruded. Dr. Case does that very nicely by means of a well-known appliance of his. I am sorry that he took such extreme ground in regard to certain appliances that have been in use for many years and have served their purpose well. The plate that he speaks of is nothing more than a vulcanite plate with which the lower incisors come in contact. When in place only the lower incisors bite upon it, and that causes the teeth to become gradually intruded, or made shorter; this once accomplished, opportunity is afforded for drawing the upper incisor teeth backward. The main thing is to get the posterior teeth extruded and the lower incisors intruded. For years I have used the vulcanite bite-plate almost exclusively in cases of this character. I insert it and let the patient wear it for from six months to a year. When the child comes back at the end of that time we find the lower incisors considerably intruded and the posterior teeth extruded. This plate has worked satisfactorily and has never failed me in a single case. This condition of excessive overbite is very much more easily corrected than the other condition spoken of.

Dr. V. E. BARNES, Cleveland, Ohio. Some of the results shown are excellent, and are ideal for the conditions. The best we can do in many of these cases is all that can be expected. Such conditions and deformities are among the very worst the orthodontist is called upon to treat, and too much credit cannot be bestowed for any close approximation to the normal bite. As to the cause of open bite I am not fully agreed with the writer, for the evidence to date points to adenoid conditions as the cause of mouth-breathing. Nose and throat specialists tell us they find adenoids and enlarged tonsils in mere infants of a few weeks. This would mean mouth-breathing long before the habit could have been formed. Another thing that I cannot believe is as to the extent of the seeming bend in the mandible. It seems bent somewhat, but probably not as much as is here given credit for; rather, I take it, the upper molars have shifted downward and inward, and the lower molars upward and inward, which shifting would surely cause an open-bite case.

Many open- and close-bite cases are not at first evident, but reveal themselves to the experienced operator in many protrusion or retrusion cases. I believe that many of the failures in orthodontia are due to not considering these bite conditions, which are as much an irregularity as the mesial or distal, or lingual or buccal, or labial malpositions.

Dr. I. J. WETHERBEE, Boston, Mass. I disagree with Dr. Case about using a plate for the correction of the condition where protruding lower incisors are found associated with close-bite distal occlusion. The inclined plane firmly attached on an appliance which is anchored to the first bicuspids, the central incisors and other anterior teeth if necessary, seems to me to be indicated in the treatment of this class of cases. It not only retrudes the lower incisors, but it opens the bite as well, allowing the bicuspids and molars to elongate. It also tends to secure normal occlusion by the so-called jumping of the bite. The bands are connected by a heavy wire, and those on the anterior teeth being soldered together and to the wire and inclined plane make a strong and firm appliance.

Dr. HARRY E. KELSEY, Baltimore, Md. I have enjoyed very much the presentation of Dr. Case's paper and the results shown on the screen. In the last year I have had a number of cases which bear on this line of work, and the results obtained seem to me to bear out Dr. Case's ideas. The appliances which I employ are constructed upon the same principle as his—many of my ideas, indeed, having been gathered from his valuable writings. I differ from him, however, in having fewer bands upon the teeth, ligatures of silk, sea-grass line, or wire being substituted where possible, because they do not leave the teeth separated when removed.

Cases of great protrusion of the maxilla with accompanying retrusion of the mandible have not, in my opinion, been successfully dealt with by the use of plates, or of crowns on the molars. By the use of intermaxillary elastics in conjunction with such appliances as Dr. Case has described, a reciprocal movement of the jaws is brought about, the lower jaw being drawn forward, and the upper teeth, together with the process around them, being drawn back, thus bringing the jaws and their teeth into normal relation with each other and with the rest of the face. Where these cases are further complicated by a very close bite, as has been shown to be frequently the case, all of the teeth posterior to the incisors and canines may require lengthening or elevating in their sockets. This will be accomplished in the molar anchorages by the action of the elastics, if they are properly adjusted, and the bicuspids will rise or elongate naturally to meet the new conditions. In all these cases I believe the teeth will adjust themselves wonderfully if the jaws be held in correct relation to each other.

I think the methods and appliances which Dr. Case has presented cover every contingency which may arise in the correction of these cases.

Dr. CASE (closing the discussion). I realize the importance of a perfect nomenclature in orthodontia, especially in the naming of conditions which are not fully recognized among recurring characters. Dr. Guilford and I fight along these lines quite often, but usually get close together before we quit. He does not like my term "open-bite malocclusion," and I certainly do not like his term "anterior non-occlusion." My reasons are: When the jaws and teeth are in the position of occlusion, the front teeth in a *normal* state are usually in non-occlusion. Again, when the front teeth are in incisal antagonism they are usually in contact only at one or two points. So, even then, the bite of many of them is open. In other words, why name as a distinct abnormal character that which exactly defines a condition that nearly always exists normally? Moreover, the term does not fully express the condition, for the reason that it is not wholly the "anterior" teeth that are in non-occlusion, but often it is the bicuspids, and occasionally the first molars—only one molar on each side antagonizing when the jaws are brought together. In choosing a term for this condition "open-bite malocclusion" is particularly applicable, because the biting teeth are always open as one of the definite characters of the malocclusion. And for the same reason "close-bite malocclusion" is applicable for the opposite condition.

In regard to the causes of this condition, I would like to have Dr. Guilford step up here in the light and show the well-defined action of the os-hyoides muscles pulling down the chin, inactively opposed to the masseter and internal pterygoid muscles. It is not wholly an involuntary action as has been stated, because the mandible assumes its natural position when the mouth is closed. The mouth is therefore absolutely forced open and held by the os-hyoides muscles when there is any obstruction to normal breathing, and being opposed by the masseter and the tissues along the middle of the jaw, rests at the condyles as fulcra, the continued action of these forces causing the jaw to retain more or less of the childhood obtuseness at the angles of the rami and body. If the jaw were bent more at this point [indicating] the front teeth would close.

Dr. Barnes seemed to think that I did not recognize the fact that mouth-breathing was caused by some obstruction of the nasal tract. I think I stated that very plainly in my paper.

Dr. Case's paper was passed, and the chairman announced as the next order of business the reading of a paper by Dr. FREDERICK FREEMAN, Boston, Mass., on "Restoration of the Functions of Mastication Subsequent to Removal of Portions of the Mandible, Including the Temporo-Maxillary Articulation."

[This paper, together with the discussion which it elicited, will be published in a future issue of the COSMOS.]

WEDNESDAY—*Afternoon Session.*

The meeting of Section I was called to order at 2.30 o'clock on Wednesday afternoon, July 26th, by the chairman, Dr. T. P. Hinman.

The first order of business was the reading of a paper by Dr. V. H. JACKSON, New York, N. Y., on "Orthodontia."

[This paper is printed in full at page 278 of the present issue of the DENTAL COSMOS.]

Discussion.

Dr. R. H. **Hofheinz**, Rochester, N. Y. Dr. Jackson's paper dwelt particularly on his system and on his own methods. I am not as conversant with the methods of other orthodontists as I am with those of Dr. Jackson, and although I have used Angle's system I am now largely using the Jackson system, and I believe that to the general practitioner who does not make orthodontia a specialty the Jackson system probably offers less obstacles than any system known to me today. After one has acquired the dexterity which is necessary to make the appliances of Dr. Jackson, I think it is probably one of the most comfortable methods of regulating teeth, because the practitioner is not obliged to see his patients so frequently as with some other systems in use, as the spring force remains active.

I frequently use a plate instead of the base wire. I find there is less objection on the part of some patients to a very small plate with the spring attachment than to the heavy wire, which interferes at times with the movements of the tongue, especially where the arch is to be expanded. He speaks of using gold in connection with the crib or with the clasp. I invariably use German silver, and I find that after the German silver has undergone electric gold-plating the appliance will go for three months in mouths where the saliva is considerably vitiated, and with very little additional plating I have been able to use this very successfully. If Dr. Jackson had given to the profession nothing but the Jackson crib he would have given us a great deal, because that crib, which is made to embrace the molars as a rule, can be made of any size and is not only valuable in orthodontia but in prosthetic dentistry, especially for partial lower plates. The profession should be extremely grateful for it. I enjoyed the paper very much, and think that the book which Dr. Jackson has recently published is one of the best contributions to the subject of orthodontia, and will always remain a standard work.

Dr. M. F. **Finley**, Washington, D. C. From a long and intimate acquaintance with the author of this paper, dating from my entrance into college, and with his work also, I have become familiar with his efforts to relieve humanity from the errors of heredity, environment, and disease, and noted the success he has attained in restoring to the form divine the beauty and symmetry which God intended each face should wear while traveling through this wonderful world.

Not enough interest is taken in orthodontia by the profession at large to place this branch of our professional duties upon the high plane it should occupy, and too much dependence is placed upon appliances already constructed and on sale at the dental supply houses for the welfare of the individual practitioner. This dependence upon purchasable ready-made appliances in orthodontia is as detrimental to the advancement of the profession as is the use of the prepared soft foods injurious to the stomachs of human beings, preventing as it does the normal amount of masticatory action which is so essential to proper digestion. If practitioners generally took enough interest in this work to construct their own appliances, and studied the cases sufficiently to be able thus to construct them, they would render better service to their patients and improve their own capabilities.

The system promulgated by Dr. Jackson more nearly meets the true ideal in orthodontic appliances than any I have used or seen applied, his system in my hands proving very satisfactory indeed, my use of it covering a period of several years. The ease with which the appliances are removed and cleansed, permitting also a thorough cleansing of the teeth and the mouth at the time of changing the pressure, is one of the strongest points in their favor, thereby being more hygienic and much less likely to cause injury to the teeth and soft parts than is the case with those appliances which are anchored to the teeth and not removable during the period of regulating. The use of metallic ligatures, as I have seen them applied, is certainly very injurious both to the teeth and the gums, impinging as they do upon the tissues in the interproximal spaces and dangerously affecting the attachment of the anterior teeth in their sockets by the natural diminution in the size of the root from the cervical margin to the apex, the tendency of the force applied being to elevate the tooth and in some instances to the permanent injury of the socket. In cases of neglect, where for any reason the patient does not return to the operator for the removal of the anchored appliances, the bands attached by nuts are left in the mouth, and in the masticatory process are driven under the gums, to their permanent injury and with serious results to the teeth as well. In the case of the Jackson appliance under these circumstances the whole appliance is readily removable.

As has been well said by Dr. Rolof B. Stanley, "The requisite qualifications in orthodontic appliances are efficiency, simplicity, delicacy, and inconspicuousness. *Efficiency* should receive the first consideration. . . . . . *Simplicity* is next in importance. . . . . . *Delicacy* applies to proportions. The freer the appliance is from bulk, the less it will interfere with the functions of the mouth, the danger of caries will be diminished, and the less will be the annoyance to the patient. *Inconspicuousness* is a consideration, but should not be made paramount to the other qualifications." (COSMOS 1905, vol. xlvii, page 380.) Certainly the Jackson system of appliances is efficient, for they will accomplish in every instance what they were intended to perform, and their construction is simplicity itself. They can be made as delicate as any appliance consistent with adequate strength, and interfere as little with the functions of the mouth as any appliance in use.

Dr. E. S. GAYLORD, New Haven, Conn. I feel that I am not capable of discussing this paper, from the fact that I do not practice orthodontia in any form, for the reason that it is my good fortune to live within seventy miles of Dr. Jackson. For the past fifteen years I have induced patients that come to me requiring orthodontia treatment to place themselves in Dr. Jackson's hands, with results that have been most gratifying to me, and particularly so to the parents of these children, ranging from the ages of eight to fifteen and twenty. The number that I have passed into Dr. Jackson's hands I am unable to say, but to dissipate any thought that there may have been mercenary motives in my sending them to him, I will say that the matter of finance between myself and Dr. Jackson, or between the patients and myself, has never been broached. My interest in the matter has been for the interest of the patients, and in every case the results have been absolutely satisfactory.

That is all that I have to say with regard to the system of Dr. Jackson. There may be other systems by which as good results may be produced, but I am not familiar with them. I do know the results that are produced from Dr. Jackson's work, and I hope there will be no reason for discontinuing our pleasant relations, although I tremble to think of the time when Dr. Jackson will tell me that he has so many patients that he will be unable to look after mine.

Dr. F. MESSERSCHMITT, Rochester, N. Y. Were it not for the fact that I am thoroughly familiar with this method of correcting malocclusion of the teeth, I would feel rather reluctant about taking part in the discussion on a paper written by Dr. Jackson, who has devoted his life to perfecting this system for the benefit of our profession and of suffering humanity. Having seen so many cases that he has corrected for patients of various ages, I think it would be consuming too much valuable time for me to attempt any criticism on the appliances presented, as no doubt the casts plainly show what has been accomplished; and I will confine my discussion to the remainder of the paper, together with a few general remarks, trusting that they will assist in bringing out a better discussion.

For a number of years I have used this system almost exclusively in my own practice, with the most gratifying results, and with very little if any discomfort to the patient. In many instances young patients attending school wear appliances on both the upper and lower arch at the same time, which they are able to remove, thereby being able to keep their teeth and appliances in a perfect condition.

In many cases I use the same appliance for retaining the moved teeth, but in some cases I think a cement-attached appliance more advisable for holding the teeth firmly in the desired position, but it should be so constructed that the teeth and mouth can be kept in a perfect hygienic condition. My method of constructing appliances is very similar to that of the essayist. I use German silver and platinum-nickel wire, making the partial clasps of gold-faced platinum, allowing the gold surface to come in contact with the teeth, and solder with chemically pure tin by means of the soldering iron.

When attempting to construct an appliance one should remember that a certain amount of time and skill are required to accomplish anything near perfection in dentistry. Failures in constructing these appliances are usually due to over-carving, or an inaccurate model; and the breaking of wires is caused by making sharp bends with flat in place of round-nose pliers.

I heartily agree with the essayist's views in regard to crown and bridge work. At the present time how eager the progressive members of our profession are to acquire knowledge and skill in porcelain dental art! not for the special benefit of their health, but because their patients demand it. Then why should not all practitioners have a thorough knowledge of orthodontia, even though at the beginning they attempt the correction of only the most simple cases? And would they not be better able to detect both local and constitutional causes in the early stages, thereby preventing the development of at least some of these cases? How many cases of irregularities present themselves, caused by the premature loss or extraction, or two long retention of deciduous teeth, or the unwise extraction of the permanent ones. We have prophylaxis and extension for prevention; now let us have prevention for malocclusion when possible.

Dr. M. L. FAY, Buffalo, N. Y. Dr. Jackson's appliances are certainly humane instruments for the correcting of these deformities. When both upper and lower arches can be expanded, the anterior teeth moved about in any desired manner, and all this accomplished without discomfort or inconvenience to the patient, it comes pretty close to being ideal. The removable feature of these appliances appeals to me greatly. They can be readily removed by the patient, the teeth and appliance thoroughly cleansed, and the mouth kept in a healthy condition. They interfere less with mastication and speech, and are less objectionable than fixed appliances.

Dr. Jackson speaks of his method of attaching collars to teeth where the reciprocal anchorage is to be used for equalizing the jaws. My method for making the attachment to the teeth is by using the spring-clasp attachment, placing a partial clasp on both buccal and lingual sides of the teeth, and then cementing this to the tooth. In this way I secure attachment without separation. The particular advantage of this method is where several teeth have to be banded, as for instance in the elevation of the bicuspids and first molars. Several thicknesses of metal would necessitate considerable separation. The spring clasp may have any attachment, such as hooks or lugs, soldered to it.

Dr. J. LOWE YOUNG, New York, N. Y. I have listened to the reading of this paper with a great deal of interest. Not only Dr. Jackson, but a number of gentlemen who have discussed this paper, have spoken of "Dr. Jackson's system." In my estimation there is only one system of orthodontia, and that is not the Jackson system, any more than it is the Angle system, nor any other one man's system. Dr. Angle denies having a system. We are dealing with the science of occlusion. It matters not what appliances are used to put the teeth in occlusion, so long as they are effective.

One speaker made the assertion that it is wrong for the profession to buy ready-made appliances for this work, and as much as said it is unethical to do so.

I would like to ask that speaker if he forges his own pluggers and excavators, and cuts his own burs? A regulating appliance is an instrument used for a certain purpose, and if it can be made by skilled workmen, who do nothing else, in such a way that we can apply it in every case of malocclusion with better results (and I defy any of you to show better results than are being shown by the men who are using these ready-made appliances), I do not see any necessity for making them in the laboratory.

I will grant that Dr. Jackson can do a great deal with his appliances, but I claim there are better appliances for this work. By the use of the Angle appliances as now made the case is under one's control in every particular. If intelligently applied they do not press into the gums and cause irritation, but will do exactly what is demanded of them. If improperly used they will cause trouble and displace the anchor teeth and others as quickly as will any other appliance. In buying one of Dr. Angle's appliances brains are not furnished to enable one to properly apply it, any more than an excavator put in the hands of a tyro enables him to properly excavate a carious tooth.

To go back to some of the illustrations shown by Dr. Jackson, in which he attempted to draw one arch forward and the other backward by the compensating elastics—

Dr. JACKSON. I do not call them compensating. I use the word equalizing as a much better word.

Dr. YOUNG. I cannot understand how you have control of your cases with "equalizing elastics," as you call them, attached to the crib, as you use it.

Dr. JACKSON. The crib is an old system which I gave up long ago.

Dr. YOUNG. Well, with your up-to-date appliances I do not see how you have control of your cases. It is a well-known fact that in the movement of teeth they are much more easily carried forward through the process than they are carried backward. Take for example a case requiring the distal movement of all the upper teeth, without disturbing the positions of the lower teeth. The way Dr. Jackson has shown the application of his force, the upper teeth would be carried back but very little, while the lower would be moved forward. By using the clamp bands and the expansion arches, with the intermaxillary elastics, we have absolute control and are able to cause distal movement of one or both sides of the upper teeth, as may be required. How? Place the D bands on the upper second molars (if they have fully erupted) and so adjust the arch that when the nuts are resting against the tubes the arch is free from the front teeth. The lower arch is ligated to all the lower teeth anterior to the D bands. Thus all of the lower teeth will be firmly bound together as an anchorage against the upper second molars. The constant pull of the intermaxillary elastics will soon start the upper molars backward, and by an occasional turning of the nuts on the upper arch we are enabled to keep the arch free from the incisors and canines and thus to carry the molars as far back as may be required. The D bands should now be moved to the upper first molars and the same procedure be repeated, and so on, one tooth on each side at a time being carried back without disturbing the lower teeth. This, gentlemen, I claim Dr. Jackson cannot do with his system, and I challenge him to show models of finished cases where he has so moved teeth.

Dr. W. H. WILLIAMSON, Aberdeen, Scotland. I regret very much that I did not hear Dr. Jackson's paper, as I have always been interested in his methods as published from time to time, and took the opportunity of the voyage out to read his latest book on "Orthodontia." Judging, however, from the diagrams, the paper is mainly devoted to the subject of expansion of the arch. In his book he devotes considerable attention to the well-known Coffin method, where the articulating surfaces are covered—an objectionable feature—and proposes another form of spring plate to obviate that objection. Still, both he and Dr. Angle seem generally to expand the arch by pressure confined to the teeth themselves, so that in many cases they present the appearance of being splayed outward, leaving the upper part of the arch as it was. Being only a general practitioner, and a mere dabbler in orthodontia, it may be presumptuous in me to express an opinion, but it seems advisable in most cases to carry the process along with the teeth, and in that way stimulate to a greater extent the development of the parts forming the floor of the nose, producing a full round palate from the beginning. To effect this general expansion I have met with no better or simpler method than one introduced some years ago by Mr. Stanley Read of Brighton, England. It consists of a stout screw of fifty threads to the inch, which moves within a piece of gold tube to correspond. To the tube, and to one end of the screw, are soldered metal tags to hold them in place in the vulcanite. The palate is covered with a wax plate in the usual way, without attachments to the teeth. The tube and screw are sunk in the wax at the top of the palate, so that the tagged ends will be covered, and the plate is vulcanized.

It may be inserted in the mouth for a day or two, and then be sawed up through the middle so that one half will hold the end of the tube and the other the end of the screw. To widen, the patient has merely to hold one half and turn the other right around, producing an exact increase of width with each revolution. If you have a patient who from whatever reason cannot return for two or three months, you may direct him to give the plate one turn each week or so. I show you here casts of the case of a patient thirteen years of age, where the appliance was put in the mouth and was not seen again for three months, the condition of the arch being then very much improved. You will observe that the thumb can be placed quite freely on the top of the palate in the cast. I have used this method in several cases, and find it very efficient, while children take a certain amount of pride in managing the plate themselves and carrying out your instructions. Dr. Jackson seemed to think it was rather simple, the dentist's part being reduced to a minimum, but I do not think that a very serious objection, especially in the circumstances that I have instanced.

The last speaker referred to the advance of orthodontia, and in that respect I think the dental world is very much indebted to America for the strenuous endeavor its leading exponents have made of late years in laying down sound scientific lines on which practice can safely proceed. At the same time I cannot agree with the broad statement that all cases of irregularity should be turned over to an orthodontist, and the illustration of the family doctor not being thought the proper person to perform an operation for appendicitis is far too extreme a case. The general practitioner should be able to treat the simple diseases of various organs, and so also the dental graduate should know, among other things, the general principles of orthodontia, and like his medical brother be able to decide whether he is competent to treat the case himself or ought to turn it over to the specialist.

Dr. V. E. **Barnes**, Cleveland, Ohio. I have been very much interested in this paper of Dr. Jackson's and have been benefited by it. Many of his methods and appliances are valuable and efficient, as I have proved in my practice. But I cannot agree that he has a "system." As I understand it, a system is a regularly organized plan which one can pursue to obtain results in any and all cases. What has been shown today is but the fraction of a system in which expansion seems to be the main and predominant feature. Expansion is not the whole of orthodontia by any means, and I do not believe the essayist's methods are flexible enough to do all that is required, or to do it in the most efficient manner. The results shown are good as to the amount of movement, but do not seem complete or finished. The statement made that by the methods shown the essayist could operate six times as fast as could any other man with any other method is far beyond reason. For instance, many orthodontists see from fifteen to twenty or more patients a day. Does it seem likely that Dr. Jackson can attend to ninety or one hundred and twenty a day and make all changes and adjustments he finds necessary? I find that the time needful to adjust various appliances is but a fraction of the time required to study and watch cases. It is not so much the kind of apparatus, but the quality of brainwork expended. Some men will get better results than others from appliances, but the best results in the long run will be obtained by the skilful use of different methods for the different conditions met with. Well-shaped teeth will retain a removable appliance and give good service, providing the patient be one who will not remove appliances as soon as your back is turned. For partially erupted teeth, the removable spring appliance has proved a failure in my hands, and I question its success in such conditions in the hands of any man.

As to the general practitioner carrying on orthodontia cases: No one can justly condemn this if he does it correctly, but the evidence today shows that he generally does not diagnose accurately or correctly, and consequently cannot treat correctly. He is not willing to spend the time and pains that the specialist finds necessary. Is it therefore any wonder that he often fails? Our friend from Scotland has said that a patient going to the general medical practitioner with an inflammation of the eye would receive treatment from him *if he knew what the trouble was,* and if it were simple. Here is the key to the situation—*knowing and diagnosing.* The trouble comes in not knowing, or in failure in diagnosis—all of which may be due to not keeping abreast of everything. No man can do all or know everything, hence the reason for the existence of the specialist in all the walks of modern life.

Do not interpret my remarks to mean that I see no good in the essayist's methods, for that is not so, rather take it that his methods seem good for limited procedures, just as all other men's methods or so-called systems are limited—none of them the best for all cases, all of them the best in some special and definite instances.

Dr. JACKSON (closing the discussion). I am glad to hear such kind remarks regarding my system of regulating; however, as one speaker has said that there is no such thing as a system, I want to state that I claim to have built up a complete system of regulating, by which the teeth and alveolar process can be moved in any desired direction, and that it meets the requirements in every case presenting. I have made it my life-study to improve the methods of correcting teeth, and for over twenty years have been giving the profession the benefit of my work in the way of public demonstrations, papers, etc., starting out with the methods then in use.

Malocclusion has been referred to as the essential point for discussion. What is orthodontia, technically, but correcting malocclusion or faulty positions of the teeth? What have I been trying to accomplish all of these years, if not the improvement of the occlusion, or the forcing teeth into correct position? I labored for years in regulating teeth by the use of ligatures, bands, screws, etc. They were so uncleanly and so uncomfortable to the patient, their application and care so laborious, that I was led to study out simpler methods that are cleanly and comfortable. Those who will not apply these valuable improvements will spend extra time unnecessarily in regulating.

I am suggesting that you multiply your capacity. Instead of seeing a patient six times a week, or less, by my methods it is generally only necessary to see them once a week at first, and later once in two weeks.

Dr. Young says that I cannot move a single tooth. Why can I not move a single tooth by my system, as well as all of the teeth. I have shown how I move the whole arch by the equalizing elastics. I have here the cast of a case in which, in eight visits, all of the incisors and one canine were moved laterally toward the left, the width of one of the canines. By my system one can move a single tooth in any direction, or two or three teeth, or the whole arch, and I show you how it is done more simply, I consider, than it has been done before. Dr. Young tells me that I cannot move the teeth backward, and I show him how I have moved the molars, bicuspids, or canines backward in the line of the arch, as well as moving the incisors. Some practitioners would like me to say that I never extract teeth for regulating. I only extract when from careful consideration of the case I find it necessary, always trying to best serve the patient.

In regard to the general practitioner and his work, I think it best for him to understand orthodontia, getting all the information he can on the subject, in order to be of benefit to his patients. It should be taught thoroughly in the dental colleges. I was among the pioneers to recommend that every practitioner should understand how stenosis causes irregularities of the teeth. (See Cosmos 1890, vol. xxxii, page 292.) I stated that every dentist should be capable of diagnosing a case and knowing whether the irregularity was caused by stenosis due to adenoid growths, deflection of the septum, enlarged tonsils, mouth-breathing, etc. The general practitioner must have this knowledge of the general etiology in order to be able to advise his patients. In the smaller towns at least, the general practitioner has to deal with cases of orthodontia, and I have perfected a system by which he can do this and not take up so much of his time as to exclude them from his practice. These cases should be looked after, and I have tried to show that an apparatus which requires the patient to be seen but once a week, or even less frequently—never more than twice a week—has a great advantage over methods that require the patient to be seen every one, two, or three days. I never feel alarmed when a patient comes into the office and tells me that he is going to Europe the next week. I simply tell him to keep the appliance in place, removing it to cleanse the teeth and appliance thoroughly at proper intervals, and when I see the case again the teeth and appliance are generally in good condition.

The subject of Dr. Jackson's paper was passed, and the chairman announced as the next order of business a paper by Dr. L. S. CHILCOTT, Bangor, Me., on "Obstetrical Deformity of the Mandible."

[This paper is printed in full at page 257 of the present issue of the DENTAL COSMOS.]

Discussion.

Dr. M. H. CRYER, Philadelphia, Pa. It gives me great pleasure to have heard this paper, and I must congratulate Dr. Chilcott on his observations. It is gratifying to know that we have men in the dental profession who in the studies of the deformities of the mandible place the trouble at so early an age as he has done. In fact I think for certain conditions of deformity we might begin with the embryo. Therefore I congratulate the essayist for bringing this matter before us, although I may not agree with his conclusions entirely.

The essayist speaks of the jaw being straightened at the time of birth. I think that is an error, for this reason: the mandible at this period is already straight or nearly so. Take a normal mandible: A line from the condyloid process to the symphysis is almost a straight one. Therefore I do not believe that in the case he speaks of it is straightened through the action of birth, because it is already straight. Further than this, the mandible is the hardest substance in the body at that time. A pressure on the mandible would cause other structures back of the condyloid process to give way first. Now, in Fig. 2, he shows a straight bone. It is possible that we can have an injury at the time of birth by delivery either with the forceps or without them, but particularly with them, and in the case the essayist speaks of I believe that the bone was injured in some way or other so that the proper development of the mandible was prevented.

There is another class of cases in which the whole mandible is carried forward until the condyloid process rests upon and articulates with the eminentia articularis. I have specimens showing a bilateral condition of this kind. During this meeting Dr. Howe of Boston has shown me pictures illustrating where the condyles rest upon the eminentia articularis on both sides. This condition I believe could be induced at the time of birth by injury with the forceps and if the jaw had been carried forward the physician should have examined it carefully to see that the mandible was carried back to its proper position.

Dr. CHILCOTT (closing the discussion). In reply to what Dr. Cryer says about the straightening of the bone, it was not my intention to say that the mandible was straightened at birth, but deformities of this kind are generally conceded to be due to the straightening of the jaw at the angle. I believe the jaw is sometimes injured at birth, and that it never again resumes its normal position. It is true that in infancy the mandible has no perceptible angle, and that it is the most fully developed bone in the body, and I think it is not unreasonable to assume that it may sustain what is called a "green-stick" fracture, and nothing occurring to draw the attention of the physician to it, it may be allowed to go on and never be replaced in the normal position.

The subject of Dr. Chilcott's paper was passed, and the chairman announced the adjournment of the section until 8 P.M.

WEDNESDAY—*Evening Session.*

Section I was called to order at 8 o'clock on Wednesday evening, by the chairman, Dr. T. P. Hinman.

The first order of business as announced by the chairman was the reading of a paper by Dr. B. L. THORPE, St. Louis, Mo., on "Pioneer Manipulators of Gold Foil."

[This paper will be published in a future issue of the DENTAL COSMOS.]

The next order of business was the reading of a paper by Dr. A. L. MIDGLEY, Providence, R. I., on "Infectious Diseases of the Mouth," as follows:

INFECTIOUS DISEASES OF THE MOUTH.

Contributions to medical journals that have a direct bearing upon dental and oral surgery are constantly appearing, and since it is generally accepted that the conditions of the mouth and teeth are important factors to be considered in the diagnosis and prognosis of many diseases, our science is daily becoming recognized more and more as a specialty of medicine, and the old idea that the field of dental surgery was merely the mechanical cleaning and filling of teeth has been discarded.

At the present time it is imperative for the dentist to have a profound knowledge of infectious diseases; thus he may be of invaluable service to the patient afflicted, protect other patients, guard against infection himself, and be of aid to the general practitioner of medicine. It is not within our province to treat constitutionally certain diseases—syphilis, cancer, diphtheria, etc.—but since we are not infrequently in a position to be the first to recognize these and other diseases in their incipience, it is clearly shown that a more minute knowledge of oral pathology and therapeutics is essential to the modern dentist.

Professional spirit is broadening, and with it dental and oral surgery, and since the standard of our profession is measured by our results, and since many of these results are obtained through a thorough knowledge of, and ability to recognize infectious lesions in their early stages, we may be of service, and can do much to place our science on a higher and broader plane.

The most important of all diseases to us is *syphilis*, which appears in two well-marked forms, acquired and hereditary. It is of interest to us not only on account of the virulence of the syphilitic poison, but also because of the ruin it may bring to us or our innocent patients through our neglect or ignorance to determine the character of any of its lesions. Manifestations of the primary, secondary, and tertiary stages of the acquired form, and also those of hereditary syphilis, may appear in or about the tissues of the mouth.

The only lesion of the first stage, the chancre, begins as a small, round, well-marked, excoriated spot with its edges raised and its center depressed, and is accompanied with inflammation of the ganglia in direct relation to the seat of the disease affected. Usually there is great variation in the size of extra-genital chancres. We may find them small and insignificant, then again deep and destructive looking. A few facts worthy of interest, and which may serve to impress the importance of this subject upon our minds are, that thirty-two per cent. of extra-genital chancres have been found about the tissues of the mouth and lips; that thirty-five per cent. of chancres of the finger are among dental and oral surgeons, and that the lips are the most frequent seat of extra-genital infection.

Pathological appearances of the secondary stage of the disease which concern us are mucous patches and condylomata. This term is a name given to mucous patches that have reached a large size, due to enormous cell-proliferation. Mucous patches are flat or slightly elevated, and vary in color from a grayish pink to a reddish brown, and in size from an eighth to a half inch in diameter. They begin as small round or oval spots; discharge a foul-smelling secretion which is highly contagious, and are found most commonly upon the mucous membrane of the cheek on a line with the occlusion of the teeth, at the angle, and upon the roof of the mouth, and also upon the tongue, fauces, and tonsils. They flourish exceedingly well on parts subject to irritation. Condylomata are large mucous patches with steep, well-defined borders, of a rosy red or grayish color, and like mucous patches, secrete a sticky, foul-smelling matter.

It is necessary, especially in the treatment of these secondary lesions, that the mouth be kept in a clean, hygienic condition—for they are aggravated, if not caused, by a poor state of dentition and the presence of tartar.

The third stage of the disease is characterized by lesions of bone and the deeper structures, but, with a better knowledge of the disease and improved methods of treatment, these lesions are not as commonly seen as formerly. We may meet with necrosis of bone, generally of the hard palate, which is very insidious, and usually appears in the median line. Syphilitic gumma of the tongue also is typical of this stage of the disease, but occurs very rarely.

Hereditary syphilis closely resembles the acquired form of the disease, but in this form the chancre does not appear. Snuffles is a prominent feature in the newborn, and is due to a thickening of the nasal mucous membrane. The child is emaciated, the skin is wrinkled and appears too large for the skeleton, and the face has a worried, anxious expression, resembling very much that of a little old man. Mucous patches and condylomata are found on the mucous membranes and on parts subject to irritation. They are round or irregular in outline, of a grayish or dark red color, and their secretion is very virulent.

In hereditary syphilis the permanent teeth are very characteristic, and considered by most writers decidedly diagnostic of the disease. Hutchinson, who first described them, says: "If the patient is of age to show them, they are most important landmarks of hereditary syphillis."

There is nothing pathognomonic of syphilis in the deciduous set. There is, however, a marked tendency to caries. In the permanent set the upper central incisors are the most typical. They are usually of a dark color, narrow, peg-shaped, with their cutting edges notched in the form of a crescent and their corners rounded. The horizontal furrows and grooves so commonly met with have probably nothing to do with syphilis, but are no doubt the result of some one of the acute infectious diseases of infancy and early childhood.

Cancer of the lip, tongue, or any other part of the oral cavity may come under our observation. Cancer of the tongue usually appears upon the side of that organ, while the initial lesion of syphilis is more apt to appear upon the dorsum of the tongue. The age of the patient, early involvement of the ganglia, and the seat of the lesion, may aid us in establishing a differential diagnosis. The resemblance between cancer of the tongue and tertiary syphilis is very striking, and it is almost impossible to distinguish between the two without the use of anti-syphilitic remedies. Affections of secondary syphilis would seldom, if ever, be likely to be mistaken for cancer.

Aside from syphilis, tuberculosis, and cancer, diseased conditions of the mouth are found more frequently and in a larger variety in infancy and childhood, than in any other period of life. In early infancy the function of the salivary glands is undeveloped, and this no doubt is the cause of much of the irritation which produces a fertile field for pyogenic and other micro-organisms. Later in childhood the etiological factors are bacteria, but here again many of these diseases are characterized by mouth-lesions which accompany or are secondary to the disease.

Since most of the acute infectious and non-infectious diseases of childhood are accompanied by some form of stomatitis, and since we all know how much the comfort and health of patients suffering from these diseases is increased if the mucous membrane of the mouth be kept in a clean, hygienic condition, it is essential that we be familiar with at least the oral pathology and therapeutics of these diseases.

Gangrenous stomatitis, which always develops in children, and in ninety per cent. of cases terminates fatally, is a destructive, ulcerative disease of the mouth. It begins usually upon the mucous membrane of the gum or cheek, or at the angle of the mouth, and advancing rapidly destroys both hard and soft tissue. It is a secondary disease, and follows measles, scarlatina, or other of the exanthematous diseases of childhood. The cause of it is unknown, but some writers attribute it to a thread-like bacillus.

Upon examination an ashy gray ulcer may be seen upon the mucous membrane of the gum or cheek, which soon turns dark and leaves a coal-black slough. The cheek is swollen, tense, and shiny, and the skin, which is red, turns blue and finally black as the process advances. Other symptoms are high temperature, coated tongue, increased flow of saliva, and drooling.

The curative treatment lies in an early diagnosis and a radical operation. Many use the Paquelin cautery and ninety-five per cent. carbolic acid very freely. Some advocate potassium chlorate internally and as a mouth-wash. Spontaneous recoveries have been recorded, but when they do take place there is usually great destruction of tissue and a frightful deformity with impaired function of the jaws.

As a rule, patients suffering from *diphtheria* are sufficiently sick to be confined to their bed, but in some cases they may be up and around so that the diphtheritic patches come under our observation. They resemble very closely the mucous patches of the secondary stage of syphilis. Upon examination the fauces may be found to be reddened, and later on a grayish white pseudo-membrane appears, first upon the tonsils and then upon the soft palate and uvula. This membrane is adherent to the mucous membrane, and later becomes brownish or yellowish in color. In addition to these lesions the cervical glands become swollen and the tonsils enlarged.

Varicella, or chicken-pox, is a highly infectious disease of the early and middle years of childhood, and is important to us because of its contagious character, for children may be up and about with the disease in progress. It shows itself in the form of an efflorescence, and may appear first in the throat or mouth, but it is not so often first found in this location as is the case with scarlet fever or measles. The characteristic lesion is a vesicle which passes through the stages of a macule and papule very quickly. The vesicle is often surrounded by a light red areola, but we do not find this areola present with all of its lesions. They are soft to the touch, and their contents rarely become pustular.

Measles is an acute infectious disease, generally making its first appearance in the throat, where the condition is very similar to the efflorescence that later appears on the skin. The lesions are very prominent upon the soft and hard palates, and appear as macules or papules of a dark red color, which may turn to a purplish red. Often these papules are found to have coalesced in some parts of the fauces, with the mucous membrane between the lesions comparatively normal in color.

The first manifestations of *scarlet fever* appear upon the mucous membrane of the throat and hard and soft palates. It is represented by an erythema covered thickly with minute macules, which are darker than the accompanying hyperemia. The efflorescence is very much like that seen upon the skin, except that the small white spots do not appear upon the inflamed mucous membrane. Later the tongue becomes reddened and its papillæ prominent, giving rise to what is known as the "strawberry tongue." In some cases there may be an exudation affecting the mucous membrane of the entire buccal cavity and throat, evidently caused by pyogenic organisms.

Stomatitis herpetica. In this disease various micro-organisms are present, but no cause, either local or general, has been found. It does not appear to be contagious nor connected with dentition, although it is commonly found during the dental period. It usually occurs alone, but may be associated with other diseases.

In addition to the reddened, swollen, catarrhal condition of the mucous membrane, small spots of different sizes and of a white or grayish white color appear upon the inner surface of the lip, on the side and under surface of the tongue, and also upon the gums. These lesions develop very rapidly from a macule into what is supposed to be a vesicle, of a glistening grayish color and surrounded by a red areola. There may be a few scattering lesions or they may appear in such large numbers as to simulate a false membrane. Other symptoms are pain, fever, profuse saliva, and drooling. The saliva is never fetid unless the disease is accompanied with some other form of stomatitis. The drooling saliva often irritates the skin of the chin and neck to such an extent that an eczematous condition results.

The prognosis is very favorable, for the disease appears to be self-limited. In the treatment an astringent, antiseptic mouth-wash is desirable, and if the lesions do not heal readily it is well to touch them with silver nitrate. In this form of stomatitis potassium chlorate is not indicated.

Stomatitis ulcerosa is a pathological condition of the mucous membrane of the mouth, and affects the gums around the teeth. It may appear in the course of a number of diseases, and may also be caused by the internal administration of arsenic, lead, mercury, and other mineral poisons. Occasionally it may occur as a local affection, with no known cause. The most common form of stomatitis ulcerosa is that caused by mercury.

At the gingival margin the gum becomes reddened and swollen, and the normal curve of the gum becomes a straight line, covering the cervical border of the tooth. The mucous membrane assumes a purplish color, and owing to the flabby condition of the gum, hemorrhage takes place upon the slightest pressure. Ordinarily the labial and buccal gingival mucous membranes are affected, but in severe cases the lingual gum only is involved. As the process advances the gums loosen from the necks of the teeth and a foul secretion is found between them and the teeth. Later a yellowish line appears upon the swollen gum. This line is at first narrow, but may become broader and involve most of the gum. The process may continue, attacking the periosteum and producing necrosis of the bone.

A differential diagnosis is not difficult to establish, for there is no other disease characterized by the purplish color and the soft, swollen condition of the gum.

The prognosis is favorable, and in the treatment, if a mineral poison is being used, it should be discontinued. Potassium chlorate internally and as a mouth-wash is very beneficial. Care should be taken in administering this drug, however, for in some children it acts as a poison, causing drowsiness, depression of the heart, suppression of urine, and even cyanosis. If the patient should be thus affected by the drug, I use a saturated solution of boric acid, with good results.

The disease called *thrush* is a local one, caused by a fungus which grows upon the mucous membrane of the mouth of infants and young children. It may be seen in the mouths of healthy children, but is more likely to appear in the weak, anemic type. The growth begins in one or more small spots, and at times the entire mucous membrane may be covered by it.

The fungus closely resembles a mass of curdled milk in appearance, but is more gray in color. It does not look like a membranous exudation but appears as elevated patches upon the membrane. It develops generally upon the inner surface of the lip, on the gum, tongue, hard and soft palates, and pharynx, and may even extend into the esophagus. The diagnosis of this disturbance is not difficult, for if we find merely a mass of curdled milk it is easily wiped away, while the fungus is very difficult to remove.

The treatment lies in the local care of the mouth. Constant removal of the growth and rubbing the parts with a non-irritating antiseptic wash is advocated, and perfect asepsis and hygienic measures are necessary, that reinfection may not take place.

For the welfare of our other patients, it is well to regard all patients—rich and poor—as infectious, and when we find any indolent ulcer in the mouth, to bear in mind the importance of early recognition and diagnosis.

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Items of Interest, vol. v, May 1899.

"Venereal and Skin Diseases." (R. W. TAYLOR.)

"System of Oral Surgery." (GARRETSON.)

"Surgical Diseases of Children." (OWEN.)

"Treves' Surgery."

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"American Text-Book of Surgery."

"American Text-Book of the Diseases of Children."

"System of Surgery." (DENNIS.)

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International Dental Journal, vol. xxiv, No. 6, page 422.

"Pediatrics." (ROTCH.)

Motion was made and carried that Dr. Midgley's paper be passed without discussion, as there were a number of matters to be transacted during the evening session.

The chairman then announced as the next order of business a paper by Dr. W. STORER HOW, Philadelphia, Pa., on "Some Phases of Crown and Bridge Work."

[This paper is printed in full at page 290 of the present issue of the DENTAL COSMOS.]

Dr. How's paper was passed, and the chairman announced as the next order of business a lantern lecture by Dr. SINCLAIR TOUSEY of New York, N. Y., on the "Uses of the X Ray in Dentistry."

Dr. Tousey demonstrated in connection with his lecture the method of using the X-ray apparatus, and exhibited many lantern slides, showing the benefits he had been able to produce in diseases of the mouth and teeth. He also demonstrated his method of making the skiagraphs of the tissues of the mouth.

There being no other business before the section, the chairman, Dr. Hinman, declared Section I adjourned *sine die*.

(To be continued.)

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

Eleventh Annual Union Meeting, Baltimore, May 1905.

THE eleventh annual union meeting of the Maryland State Dental Association and the District of Columbia Dental Society was held in the lecture hall of the Baltimore Medical College, Baltimore, Md., May 25, 26 and 27, 1905.

The first session was called to order at 8 o'clock Thursday night, May 25th, by Dr. W. G. Foster, chairman of the Joint Committee of Arrangements.

Rev. S. M. Alford, Baltimore, opened the meeting with prayer.

Dr. Foster then introduced the president of the Maryland State Dental Association, Dr. A. C. Brewer, Baltimore, who made an address of welcome, which was responded to by the president of the District of Columbia Dental Society, Dr. S. W. Bowles, Washington.

The first order of business was the reading of a paper by Dr. W. A. MILLS of Baltimore, entitled "Chloasma Traumaticum," as follows:

CHLOASMA TRAUMATICUM OF THE GINGIVAL TISSUE.*

A peculiar coloring of certain portions of the mucous covering surrounding the teeth has often been noticed. As no mention is made of it in any medical or dental literature, its origin was doubtful until recently.

Three forms are seen: spear-shape, crescent-shape, and coalesced. The first follows the line of the tooth septum, the second the festoons, and the third is a combination of the two preceding forms.

Common pigmentation, as seen in warts, moles, and birthmarks is always either congenital or the sequel of hyperemic conditions, associated with inflammatory and melanotic processes.

The stain came from within, and was deposited in the cells, and the protoplasm of the same through the hematin of the blood—a physiologic procedure—but may become pathological by irritation or senility, and without removal may develop into sarcoma or carcinoma.

The mechanical blurring of the skin is, in all cases, the result of external influences, either accidental or intentional. The majority of dermal specialists claim that nothing more serious is produced than disfigurement; to the latter class the subject of this paper belongs.

The casual streaking and spotting of the cervical borders and interdental spaces being unlike the characteristic purplish lines of chronic lead or silver nitrate poisoning, was supposed to have been due to ruptured capillary blood-vessels, or to atavism, as similar traits, while more extensive, are general in the mouths of negroes.

The cause was found in the cutting and laceration of the membranes by abrading disks used in polishing approximal and buccal fillings, especially amalgam; it is presumed that the débris was absorbed or driven into the injured surfaces, and after healing remained fixed.

Unfortunately, no anatomical examination has been made to verify either statement. The tinctured structures are clearly defined, circumscribed, and take their hues from the substance introduced; usually shading from yellow to bluish black, and most pronounced at the point of entrance.

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* H. V. Ziemssen, M.D., Munich, "Diseases of the Skin." Geo. Thomas Jackson, M.D., "Diseases of the Skin." J. M. H. Macleod, M.D., "Pathology of the Skin." Craker, "Diseases of the Skin."

Whether the inclosed or encysted foreign matter will in time excite any lesion is unknown; so far no increase, decrease, or degeneration of the affected parts has been observed; it is certain the subject is branded for life, as all attempts to obliterate the marks by surgical or chemical means have failed.

To disfigure a pretty face or expressive countenance by the commercial use of gold crowns and bridges is unprofessional, but to mar forever, by tattooing, the ruby-tinged drapery of the oral cavity, by the negligent use of instruments, is almost criminal.

Discussion.

Dr. Mills. I surely thought that someone present would have something to say in discussing this paper, for the reason that in a large number of our patients we often see these stains or discolorations in their teeth. In the cases spoken of in the paper, as stated, it was first thought to be due to rupture of a bloodvessel, but by examination and watchfulness it was discovered to be due to injury done in the polishing of fillings. These marks are very readily produced by polishing with disks, carborundum stones, tapes, etc., causing a deposit of amalgam dust, gold dust, etc. I recall the case of one young lady, who has a very beautiful mouth and denture, in which the gum tissues were wounded between the central and lateral incisors, and whenever she laughs you can see a little unsightly streak. I am sure that we have all had such experiences, and I have simply given the paper to warn you against the careless use of disks, etc. Doubtless, after this, some of those present will think more about the subject.

Dr. B. Holly Smith, Baltimore. It seems to me that there is some helpful thought that comes to us from Dr. Mills' paper. I want to state, however, that I think the essayist has misinterpreted to a certain extent some of the mechanical influences that occur, as he says, from the careless use of the disk in conjunction with powdered substances that really have no right to be used in the mouth. For instance, all of us who have made observations have noticed the presence of charcoal, buried down in the gum, which had been used as a tooth-powder. I take exception to Dr. Mills' statement that these substances have been absorbed, but I think that they have been placed there mechanically. The paper brings to me this helpful thought, that in the use of compressed air in our offices we have an opportunity to clean out after all operations, and by means of the antiseptic spray to clean the sulci of the gum and remove any accidental lodgment. After the use of sandpaper, any accidental lodgment that may occur can be cleaned out by the use of the spray with some of the pleasant solutions that are offered to us every day. Just shoot the spray in and clean out the pockets, and do not let any foreign substance lodge. I take exception to his statement in the paper in regard to liver spots. The term he uses is a little too hard for me, and I don't think he did right to try to get so far ahead of the medical profession and so far ahead of the dictionaries in the use of his terms.

Dr. Mills. I differ with Dr. Smith on several points. I did not claim to know positively how the stain occurred; I simply made the statement that I believed it was caused in the manner described. I also stated that no anatomical examination had been made, but Dr. Liebig says that the foreign matter is simply forced into the epidermis, and does not go much farther.

Permit me to inform Dr. Smith that most dental as well as medical words in common use today are mere misnomers, and under the circumstances it is presumed that one has a sufficient knowledge, as professional men should have, to know how, when, and where to use these terms in order to give the fullest expression to one's ideas. The words "chloasma traumaticum" were used because they conveyed the most intelligent description, at a glance, of the conditions described in my paper. A single Greek or Latin word conveys to the understanding mind more at first view than any possible combination of English words.

Dr. **Holly Smith.** Chloasma is, according to the dictionary, an obsolete word for liver spots. I did not use the word. It is an obsolete word, and I don't use obsolete words.

Dr. **Mills.** I wish to say that before I dared to use the words I carried my paper for examination and criticism to a professor of Greek in one of our leading colleges, and he said that the title was not only perfectly correct but very suitable for the paper, therefore I felt safe in using the words, and I have no further apologies to make in their defense.

Dr. **M. F. Finley**, Washington. The thought occurred to me after Dr. Smith made his statement, that another means of avoiding injury to the gum, and bearing on the statement of the paper, would be the retention of the rubber dam in place until all polishing was finished, preventing the forcing of the polishing material into the tissues. I would also like to mention the fact that a similar paper was presented to the National Association five or six years ago by Dr. J. D. Patterson, but the points are not distinct enough in my mind for me to express them.

On motion the subject was passed, and the president, Dr. Brewer, announced as the next paper on the program that by Dr. **Frederick Primrose**, Baltimore, entitled "Extensive Bridging After Pyorrhea," as follows:

Extensive Bridging After Pyorrhea.

The purpose of this paper is to give to this society the writer's experience in the treatment of those cases of pyorrhea alveolaris that are commonly discarded by our profession as hopeless. We therefore pass the initiatory stages in this devastating malady and call your attention at once to cases where the teeth are either useless because of this disease, or the loss of many of them has destroyed occlusion, thus rendering mastication painful or impossible.

The Invincible Armada sent by Philip to conquer England anchored off the island bearing the confidence of Spain's haughty ruler that he would crush the pride of England's Virgin Queen. The little English vessels, almost microbic when compared to those Spanish three-decked men-of-war, went forth to attack those masterpieces of naval construction, and ruined that proud fleet, so that there remained to return to Spain only a few scattered hulks. So those beautifully placed dental arches, anchored securely in the dental cavity, which in early life seemed invincible, have been attacked, torn asunder, devastated by the onslaught of interstitial gingivitis until there remain to return to the dentist only a few scattered hulks on which to build a comfortable and useful denture. Can it be done? Would the operator be justified?

We answer, Yes! Experience says "yes," and nature has proved that she will help us. Our experience dates back at least fifteen years, and we have yet to regret our first case.

As soon as a man advocates a procedure contrary to the accepted teachings and opinions of men, so soon must he meet with opposition. Nevertheless it is man's duty to man to give to his profession his practical experience, the untarnished truth of his scientific methods and results. Progress means opposition, and one has only to consult history, whether civil, political, or professional, to prove it. Truth must prevail; ignorance and superstition must fail.

To repeat, we do not base upon the experience of a year or two, but present the result of methodical observations covering years of experimental procedure, culminating in all the collateral and correlative factors which go to make up the purpose of this paper. Thus we speak "with authority," knowing that experience has taught us to lay aside much of early teaching and to do things contrary to accepted ideas. Let me quote from Dr. Kirk's admirable paper on "Scientific Methods in Dentistry": "The gradual evolution of truth, the discovery of facts, the correlation and organization of knowledge, and its formulation in the exact terms of scientific record, have kept up an increasing antagonism with that element of social organizations which shrinks from advancement, which protests against the substituting of the new for the old, and which is content with things as they are. It is unnecessary to cite instances, as we are all familiar with the general fact, and history furnishes many classic examples where the protest of conservatism against the progress of scientific truth has been recorded in acts of bloodshed and homicidal vengeance."

The dentists of the past, and many of today, are too ready to throw nature to the winds, and rely upon their mechanical and physical knowledge alone to substitute dentures where either disease or criminal extraction has in part deprived the individual of his teeth. They forget, or never knew, that there is a *vis medicatrix naturæ;* and has not nature been kind in distributing her healing power to the oral tissues? When necessity demands her help she responds magnificently, if only the dentist knows how to bid her.

Take a miserable discarded tooth, rid it of its filthy environments, make it absolutely or nearly immovable, and you will be surprised at the amount of work that tooth will accomplish. Here is science, here is progress, and it is measurable by the degree to which we utilize these offending members.

The point of this paper is this: Make use of every one of these teeth, or parts of them, wherein lies a spark of vitality.

The old adage which applies to the loaf also applies to the tooth. Half a tooth is better than no tooth. We find in the phagedenic forms of pericementitis that one root may be entirely dead, partly necrosed, lying in position as would any foreign body having no physiological connection with its alveolus, while the other root or roots are fairly firm and healthy. In these cases bisect the tooth, or amputate the root or roots, as circumstances may demand or your experience direct. You will find that the remaining portion or portions will take upon them a double share of work, and not only become healthy and firm, but will prove of the greatest benefit in securing and putting at rest the other diseased teeth.

We give you here a truth. The physiological reasons we know not, but the fact may be seen in scores of mouths attacked by pyorrhea. "A pulpless tooth is far more immune from attacks of this disease than is a perfect one." We recall a case exhibited at a recent clinic. Every tooth in a man's mouth had been attacked by pyorrhea save one, and that had been devitalized in early youth and was absolutely healthy. Why attempt to save pulps when their retention hinders thorough treatment for the removal of the cause, and complicates and intensifies the operations?

Every operator has his *modus operandi* giving him more or less success, but thorough sterilization and antiseptic filling of root-canals are as essential in dentistry as in more vital surgery, and failure is, comparatively, *nil.*

But how are we to restore those lacerated and loose teeth so that they will become healthy, useful, and comfortable members? We answer, Unite them as abutments for bridge work. In a bridge properly placed the force is equally distributed. With the combined resistance of the several bridged roots and a correct occlusion, a condition of perfect rest is brought about. The cause being removed nature will respond, giving happy results to both the operator and the patient. Let me quote from a recent article by Dr. C. J. Grieves: "It is the writer's firm conviction that the return to health of a denture disorganized by pyorrhea can be more readily accomplished by cleanly fixed bridge work as a splint, and the healthy exercise which it guarantees to the teeth, alveoli, and associate membranes, than by any other known means."

Let me cite a case in the upper arch. The scattered hulk that remains may be a molar on either side, a canine, or it may be a bicuspid; probably a plate has been worn (plates are precursory to this disease, especially if worn at night). Here we have a case for a denture of twelve or fourteen teeth, and it should always be inserted in one piece. The weight of the bridge has no significance so long as the occlusion is bilateral, and even when only partly so the results are good. In such a case one may assure the patient that with proper care and intelligent professional attention a bridge can be worn comfortably and mastication restored almost perfectly for a period of five, ten, or fifteen years. What more can be asked? These cases present themselves in middle life or later, and if a denture can be placed which will give absolute satisfaction for ten or even for five years, we claim that the operator is justified in inserting it and will have given an ample *quid pro quo* for the fee received.

The progressive man learns from experience, and changes must come in his mode of operating. We purpose pleading in behalf of the saddle or bridge work, not only between abutments, but beyond. We use them for strength, cleanliness, and comfort. We hear this mode of operating condemned by many teachers, but take it for granted they either have never placed one or have not known how to place one properly. With a saddle placed as it should be the tissues will dip toward the opposing surfaces, making it absolutely hygienic, and the proof may be seen should such a bridge be removed in after years: the saddle will be found as clean and bright as when inserted. In a paper of this description it would be utterly impossible to cover the ground of crown and bridge work. Every man has his own ideas and will practice them; but properly prepared roots, so that bands may be adjusted perfectly, is as essential as laying the foundation for any masterpiece of mechanical construction.

We find it good practice to cut off loose and diseased teeth and let them remain at rest for a season. Carefully cleanse the roots by removing all deposit and unhealthy tissue, polish the roots as far toward the apex as one's experience and judgment dictate, after the mode taught by Dr. D. D. Smith. The improvement will be marked and permanent, and like the graft in the old apple tree. New life seems to spring forth.

In spite of all our learning, care, and skill, we may not be able to save every tooth; as the physician must meet with fatal cases, so must we meet with some failures. However, be not discouraged, nor condemn a mode of procedure because of one, two, or more failures. Enough teeth can be saved, even in extreme cases, to ward off the use of the plate by a properly placed bridge, thus restoring as nearly as possible on the scattered hulks a perfect denture.

Discussion.

Dr. B. HOLLY SMITH, Baltimore. I think we are very much indebted to Dr. Primrose for this beautiful presentation of his method of practice, but it seems to me that he skips as lightly over the subject as a swallow over the water, and I would like to have him speak more definitely as to the technique of his method of taking advantage of the saddle. Certainly this is very much the best method of practice. In my hands twenty years ago it became an abomination, but I have gradually learned to think it is helpful, and largely through the influence of the gentleman who has just read the paper. I would like him to give us some idea of his method and of the manner of adjusting the saddle. If we can use this and nicely relate the abutments so as to secure just the proper cushion for the saddle, it is a delight, but if it is not adjusted in that way it is an abomination; I would like to hear the essayist tell how that is done in his own way.

Dr. J. A. LIBBEY, Pittsburg, Pa. There are many points in the paper in which I agree with the essayist entirely, but there are one or two in which I cannot. Allusion to the mouth in which he said the one tooth that had been devitalized was a healthy one while every other tooth was affected with pyorrhea reminds me of a case I saw some years ago. It was that of the wife of a congressman from our district. In that mouth there was not a tooth, except one, that was not almost past saving, as the result of pyorrhea. That tooth was a porcelain-crowned bicuspid solidly set in its alveolus and surrounded by perfectly healthy gum tissue. Now, what was the reason for this single tooth having resisted the ravages of pyorrhea? I believed at the time that the cause related to the devitalizing of the pulp, which had increased the blood supply to the pericementum, but now I believe that the correcting of the occlusion had more to do with that healthy change than anything else. I believe that malocclusion is responsible for the development of this disease to a greater degree than any other one thing.

I was glad to hear the essayist speak particularly of the imperative necessity of thorough prophylaxis before operating on teeth to be subsequently used as abutments. In the first place, not more than from one to three of these teeth should be operated on at a time; we should remove every particle of deposit possible, and thoroughly polish the tooth-surfaces, thereby stimulating the pericementum. The use of bridges should then be resorted to to prevent any lateral or other motion possible because of the existing malocclusion. In the great majority of cases those teeth will become healthy and will afterward show no signs of pyorrhea. I have seen roots that were so loose that I could almost extract them with my finger tighten up and become healthy by the use of a perfectly fitting bridge.

There is one point in the paper that I cannot agree with, and that I cannot allow to pass without saying a word on it, and that is in regard to the saddle bridge. A fixed saddle I think is one of the filthiest things possible to put in anyone's mouth, and knowing the reputation of the essayist for careful work along that line, I do not feel that I am saying too much when I state that it is next to impossible to make a bridge of that kind that is hygienic. I make for the kind of cases under discussion saddle bridges, but never of the fixed variety. In every instance I make them removable. I had a case of this kind last year, that of a patient who wanted a bridge inserted shortly before going to the St. Louis Fair. I put in a full upper saddle bridge, and I warned her particularly to remove it every day and clean it thoroughly. After she left and had been at the fair a few days, I received a postal card from her saying that the bridge was doing finely. She was gone six weeks, and when she returned she came to my office to tell me of the excellent service the bridge was rendering. I asked her if she had complied with all my instructions, and she said she guessed she had with the exception of taking it out and cleaning it. She said she had not taken it out at all. The bridge which had then been in the mouth six weeks was as nice a fitting saddle as I ever saw, and if you could have seen underneath that saddle when it was taken out you would have come to the conclusion that, in spite of the patient's assurances to the contrary, the saddle was not a very cleanly thing to have in the mouth for six weeks without cleaning it; and I do not know how it could be possible to clean this kind of bridge without taking it out.

I want to congratulate the essayist on his work. With that one exception I must coincide with everything he has claimed.

Dr. E. E. Cruzen, Baltimore. I am familiar with the work as described and done by the essayist. It has been my privilege and good fortune to be one of several gentlemen who were present on an occasion when the essayist had a number of patients in his office for the purpose of examining a number of bridges which had been in place from two to eight years, and the results were remarkable. The patients told us that the teeth were all loose when they presented themselves to Dr. Primrose for treatment, and I can testify to the fact that the bridges were firm when we examined them, and looked as though they would do good service for some years to come.

There was one case in particular that was extremely interesting. It was a full lower bridge anchored on six teeth, which had been doing service for eight years and was still firm. From the description the patients gave of the condition of the teeth before they had been operated upon I should have expected failure within a year. But I think differently of that condition now. I use such teeth for anchorage when I feel that I have successfully removed all deposits from the roots, and I expect my patients to have a reasonable amount of comfort and satisfaction with the bridge.

As regards the saddle I am not prepared to say it is the only way to make a bridge, although I am using it in many cases now and am pretty well convinced that it is the most cleanly. I have had occasion to compare the two methods in the same mouth where the saddle bridge was on one side and the bridge with the so-called "self-cleansing" space was on the other, and I must say that the saddle has been much the cleaner of the two.

Dr. C. J. GRIEVES, Baltimore. I want to thank Dr. Primrose for the paper, and to say that I have learned a great deal along this line from him. I am glad that he accentuated the great value of fixed bridge work and that of splinting a few abutment teeth, thus obtaining the resistance to stress possible from a unison of multiples. A few scattered teeth on either side of the arch, when united, present to masticating stress a resistance much greater than the sum of the abutments, particularly in large cases; four would not mean four, but possibly eight, for the reason that the roots diverge in crossing the arch and a blow delivered on any part of the bridge is balanced by all. I congratulate Dr. Primrose on advocating fixed bridges as the best splints for pyorrhea. Removable saddle bridges have been mentioned tonight in this connection. My experience in this line has been a sad one, and I would define any removable bridge as a wedge placed between teeth which under mastication soon becomes displaced, thus loosening up the firmest of abutment roots, and a device not to be thought of as a means of retention in pyorrhea. The correction of occlusion possible in this type of work is a point of great importance. All canines both natural and artificial should be ground rather flat in order to relieve strain on already weakened abutment roots and to meet new conditions.

All of my fixed bridges have been for years saddled to absolutely fit the ridges, strictly as a hygienic measure and not for support. It can readily be proved that the cleanest part of a bridge so constructed is not what the patient can clean and usually does not, but the narrow saddle surface directly in contact with the membranes. Answering Dr. Smith's objection, I would say that the reason why the saddle is in such ill repute in connection with fixed bridges is because the criticisms are based on the use of the broad saddle of the removable bridge type, extending too far over the ridges laterally. When such a bridge is really used, the joint of the soft tissues with the saddle being exposed, the food which becomes lodged in the joint irritates the tissues, which soon become hypertrophied, covering the buccal walls of the bridge eventually and necessitating its removal. The saddle used by Dr. Primrose is of platinum and is narrow, being about one-third the width of the occlusal surfaces of the dummies, having ample contour buccally and lingually to protect its joint with the soft tissue. It is very important that such a bridge be worn loose in the mouth with nothing to attach it but the fit of the abutment crowns, so that it may settle as righting and paralleling the abutment roots. The patient should be seen daily, and the saddle should be ground to absolute contact. In setting such a bridge the least bit of cement left under the saddle always proves fatal. The saddle should be oiled, and each intersection between dummies wrapped with floss silk, and when the cement is semi-hard the silks are swept to and fro under the saddle in order to remove all débris.

The pathology covering the cases is most interesting. We have all noticed the point Dr. Primrose makes and which Dr. Libbey confirms, viz, that teeth devitalized before and during pyorrhea are free from it, and, while we might theorize, I think there is an evident reason for it. Dr. Talbot has taught us that pyorrhea is largely arterial and alveolar rather than peridental, beginning in an arteritis. The arterial supply to the dental pulp would surely be among the first to suffer, and long before the gingival symptoms manifest themselves I can readily conceive how pulp atrophy and degeneration may supervene. This degenerative tissue must of necessity affect the apical circulation, and its removal by devitalization, if done aseptically, could not but improve matters. Add to the above an occlusion relieved, the deposits removed, and the roots splinted by a bridge, and we have an absolutely perfect surgical procedure, the results of which are bound to be remarkable.

Dr. WMS. DONNALLY, Washington. I have very little to say, but I wish to commend Dr. Primrose for bringing the subject before the society in such a masterly manner. I believe he is absolutely right, and the criticism brought out by the paper I think is the result of a misapprehension of what is meant by the saddle—and that seems to be the only point of difference in opinion. I have seen cases of twenty years' standing, loose teeth that I believe could have been extracted with the fingers, held in position by the bridge and doing good service today. I am not greatly in favor of crowns and bridges but rather deplore the abuse of this kind of work, yet, in the treatment of pyorrhea the first and most essential factor of success is fixity of the teeth, and necessarily this condition must be brought about in such a way as to produce perfect occlusion. When you have done this you have done mechanically all that we can possibly do for the case, and the balance of the treatment is surgical—wholly surgical. The explanations made by Dr. Grieves as to the theory of dead teeth being more free from this disease than living teeth may or may not be correct. I am absolutely unable, after closely observing teeth for fifteen years with reference to this question, to say whether or not dead teeth are more or less susceptible to this disease than living ones. In contradiction of what has been presented by the essayist, I had presented to me a few days ago a case, which Dr. Libbey saw in my office this morning, in which the worst tooth in the mouth was the one devitalized tooth, pyorrhea having affected it to such an extent that the patient remarked that he had never been able to forget the presence of that tooth for a moment. Yet it had been thoroughly treated, there was no sign of an alveolar abscess, and to all appearances the root-canals had been thoroughly treated and filled. I could mention many other similar cases. I hesitate to devitalize a tooth unless there is some other reason than the mere fact that pyorrhea is present.

Dr. GRANT MITCHELL, Youngstown, Ohio. Generally saddles are unhealthy, because they are improperly made, covering too much surface; as Dr. Grieves has said, when they cover large areas the secretions from the tissues beneath the saddle, even if the lodgment of food were impossible, is sufficient to make them an abomination to both the dentist and the patient.

Dr. H. E. KELSEY, Baltimore. I would like to ask Dr. Primrose if he makes a platinum base for his saddle, and if he claims that platinum used as a base for the saddle and in contact with the gum tissue is more cleanly than a bar of gold would be in the same position; and also if after several years he finds the platinum clean and bright where he would find the gold saddle covered more or less with accumulations.

Dr. F. GROSHANS, Baltimore. I would like to ask the essayist if he finds any difference in the lasting qualities of upper and lower bridges. And whether the weight of the upper bridge has anything to do with the lasting qualities of the bridge. Does not the additional weight of the metal required to construct the bridge serve as a constant pull on the roots? The pressure of mastication being in the form of a constant push motion, the up-and-down movements may lessen the length of life of an upper bridge; whereas in the mandible the weight of a bridge is toward gravity, as is also the pressure of mastication. My experience is that lower bridges last four times as long as upper ones.

Dr. A. J. VOLCK, Baltimore. I do not use the saddle in all cases where the teeth are affected with pyorrhea, but I appreciate the fact that in many cases where the teeth are properly treated the saddle is a good thing; I cannot say, however, that I approve of the use of it in all cases. There are many cases in which the very fact that we are obliged to make a bridge makes it also necessary that we make one that we can be assured is capable of being kept clean, and the saddle in all cases cannot be kept clean. I think it would be well for Dr. Primrose to explain more definitely not only his method of making the saddles, but also of treating the teeth before the saddles are inserted.

Dr. PRIMROSE (closing the discussion). In answer to the question of the comparative lasting qualities of upper and lower bridges, I find that there is no difference whatever as to their endurance. The weight of the bridge has no significance, providing the occlusion is correct. In answer to the question of the platinum base, I will say that I use the latter for all of my bridges, and the saddles are made as narrow as possible.

With regard to the method of making the bridge, one way I have of constructing the saddle is as follows: I first, of course, obtain an impression in plaster. I use in some cases the platinum foil such as is used for inlay work; and with the hard wax that we all have on our tables it can be smoothed absolutely over the case and it will stick to the cast. The teeth are then set up to a point of contact with the platinum foil, and the case is invested in such a way that the foil will be caught by the investment and the piece is soldered. This, however, is worked out to suit one's own ideas, as every man has to learn by his own experience, and it requires some time to become accustomed to these things and the best way of doing them. Another way is to use Melotte's metal, making a cast of this as for any other piece of work, to be used as a base for the saddle, taking care that the saddle be narrow and the edges well rounded; these are points that are absolutely necessary.

In removing a piece of saddle-bridge work from the mouth, the former having possibly been loose for several weeks or months, if we find it filthy, is it the fault of the saddle? No, it is because the whole mass has been movable in the mouth, and because the patient has not been able to reach the surfaces of the saddle so as to keep them clean. But where these cases are absolutely immovable, if you have occasion to remove them, you will notice that the platinum is clean and bright. I have seen cases where after having been worn for years, the saddles came out as clean as when first inserted. I remember that at the last meeting of this society a gentleman from New York told me that he had worn a piece of this kind of work in his mouth for many years, and that he had experienced no inconvenience, as it had not given rise to any odor or taste that could in any way affect the breath, and that he had not suffered any discomfort whatever. If you will just watch these cases and examine them from time to time and notice the conditions, you can judge for yourself whether the practice is correct or not.

Dr. B. HOLLY SMITH, Baltimore. Before you cement the bridge on, do you allow it to adjust itself to the tissues?

Dr. PRIMROSE. I always allow the patient to wear an extensive piece of bridge work for a time until everything is properly adjusted and comfortable, and when it is adjusted as nearly perfect as I can make it, I set it in place permanently.

A MEMBER. What method do you adopt to prevent the cement from getting under the saddle?

Dr. PRIMROSE. I tie a piece of thin rubber dam under the saddle, and when this is removed it will carry everything with it. When it is necessary to use anything to keep the cement from getting under the saddle, just tie a bit of rubber dam, stretching it over the lower surface of the saddle, and as at the point where the crown and the saddle unite there is a groove, the dam is fastened to it so that when it is slipped out the cement is carried away with it.

A MEMBER. Will not the application of the rubber prevent the adaptation of the bridge properly?

Dr. PRIMROSE. No; the tissues are soft and will give way for the dam, and the thickness of the dam when stretched amounts to almost nothing.

Dr. MILLS. Give us some idea of your

treatment of the patient preparatory to the placing of the bridge.

Dr. Primrose. I carry out Dr. Smith's plan as nearly as possible. I thoroughly scale the roots, cut away all dead tissue, and bur out the dead bone tissue, so that when the operation is finished I am positive that nothing remains but healthy tissue. Any antiseptic that best suits your idea may be used, but I assure you that the thorough cleaning and scraping is the treatment upon which one can depend for good results. One need not be afraid to launch out into this mode of treatment. There are numerous cases in which people are wearing plates today unnecessarily, had the dentists only inserted these extensive pieces of bridge work. I can show you a number of cases where patients have been wearing these kinds of bridges supported on four or five roots, and sometimes on three roots, for six and eight years with perfect satisfaction, the teeth being just as good now as when the pieces were inserted. I have seen these conditions.

I have confidence in the procedure which I am advocating, and feel that in carrying it out I give the patient the best possible service.

(To be continued.)

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Monthly Meeting, March 1905.

A regular meeting of the First District Dental Society of the State of New York was held on Tuesday evening, March 14, 1905, at the Academy of Medicine, No. 17 West Forty-third street, New York city, the president, Dr. Henry D. Hatch, in the chair.

Mr. F. LeRoy Satterlee, Jr., director of the X-ray and physical laboratories of the New York College of Dentistry, read a paper on "The X Ray in Dentistry," with illustrations.

[This paper is printed in full at page 260 of the present issue of the Cosmos.]

Discussion.

Dr. A. R. Starr. Mr. Satterlee has gone into the matter very thoroughly, and has no doubt enlightened many of you, as he has me, upon this subject. In regard to the therapeutic value of the X ray I have not much to say, because I have had very little experience with it in that way. The only case which I referred to Mr. Satterlee for treatment was one of pyorrhea alveolaris. The case was treated by him half a dozen times and showed marked benefit; but as the patient was undergoing additional treatment in the meantime, I can hardly tell how much of the benefit should be ascribed to the X ray and high-frequency current, and how much to the other treatment. I believe, however, that with the use of the X ray and high-frequency current in combination with the other treatment the patient was made to feel more comfortable than would have been possible with the therapeutic treatment alone.

So far as concerns the X ray as a means of diagnosis, Mr. Satterlee has told us of many occasions on which it could be used to advantage. I believe it is very valuable for the purpose of making diagnoses in cases of exostosis; absorption of roots; perforation of roots; pulp-nodules; fracture of the teeth or jaws; dislocations; foreign bodies in the alveoli; impacted teeth; necrosed areas; diseases of the antrum, and to aid in studying the location and nature of alveolar abscesses and tumors. The general condition of root-canals is shown very clearly by radiographs, and very frequently these pictures will be of great advantage to us in determining whether the root has been or can be properly filled, as I will endeavor to show you by a few diagrams.

I want to say a word in regard to one or two points brought out in the paper, one of which is in connection with the sharp line of demarkation which exists around abscesses. Mr. Satterlee's theory is no doubt correct: it is probably an attempt on the part of nature to limit the extent of the inflammation by the deposit of an extra amount of calcium salts, forming a barrier around the diseased area.

As to the light area surrounding the real abscess cavity, I hardly think it is due to the infiltration of pus; it may be due to the presence of pus in the cavity, and its radio-activity in the picture; but I do not think it is due to pus infiltration, for I believe that infiltration is confined to the immediate area as marked by the boundary of the abscess.

I have a few lantern slides which may amplify what has been gone over by Mr. Satterlee in illustration of the method of taking the X-ray pictures for the purpose of determining the condition of the roots.

The diagram which I will now show on the screen illustrates a case of abscess at the apex of an upper left lateral incisor. In the attempt to remove the old root-canal filling with a small Gates-Glidden drill, the instrument was deflected by an obstruction in the canal, and perforated the side of the root near the apex. The perforation was sufficiently near the apex to communicate with the abscess cavity and liberate the pus, but judging from the short distance from the crown of the tooth to the point of penetration, I concluded that the conditions in the vicinity of the apex demanded immediate attention. I passed a small broach into the canal and through the orifice made by the drill, and then had an X-ray picture taken with this broach *in situ*. That picture is now on the screen and clearly shows the broach passing through the false opening at the side of the root. Also, that there is still something remaining in the canal between the point of penetration and the apex. This radiograph showed the location of the false opening and the general outline of the apical portion of the root. I again explored the canal with broaches and reamers, and finally succeeded in removing the obstruction from the apical portion, which was found to be a broken reamer which had been in the canal for years.

The next step was to close the false opening in the side of the root with a small pellet of gutta-percha, and then, in order to make sure that the apex had been reached, a broach was passed into the newly found orifice, sealed in position, and a second radiograph taken. This second radiograph is now shown on the screen, and you observe that the broach passes directly through the apex. The abscess was a severe one and accompanied by a slight amount of necrosis, several small fragments of the alveolus being removed or coming away through a fistulous opening.

As soon as the flow of pus had diminished and the canal could be kept dry, it was closed with gutta-percha, and a third picture was taken. That picture we now show, and it demonstrates the fact that our root-filling did not reach the apex. This imperfect root-canal filling was removed, the apical portion of the canal enlarged by means of Donaldson cleansers and Kerr broaches, and the canal again filled with gutta-percha. This time the canal filling was a success and reached exactly to the apex—as can be demonstrated by the next radiograph of the case—which we now show. We have still another radiograph of this case taken about three or four months subsequent to the beginning of treatment. It is before you now, and illustrates the manner in which repair is going on. The former light area of the abscess is growing darker and is also much diminished in size. There has been no further trouble up to date.

Dr. Sinclair Tousey. Modern apparatus is one of the divisions which Dr. Satterlee makes of the subject. The improvements which have been made are in two directions: efficiency and exact dosage. It seems incredible that only a few short years ago an elbow picture should on one occasion have required an exposure of four hours, while now it is possible to take a better radiograph of the elbow in a single second. This wonderful change is due in part to increased power in the apparatus used to produce the X ray, and partly to improved technique. With the same apparatus, and turning on the same strength of current, it is possible to produce rays of very great diversity. Depending in large part upon the degree of the vacuum in the X-ray tube, the ray may have so little penetrating power that even the flesh is opaque to it; at a medium vacuum the flesh is transparent, the bones cast but a faint shadow, and even the teeth are penetrated so as to show the root-canals; at an extremely high vacuum the penetration is so great that only heavy metallic bodies cast any shadow at all. The knowledge of the proper degree of penetration, among all the hundred possible gradations, enables us to get the desired results in pictures or treatment. Very many other factors besides the degree of vacuum in the tube enter into the problem of the production of proper radiance. They are largely connected with the elimination of the inverse discharge, and are technical details which perhaps would not interest you.

The means of exact dosage are, first, the radiometer—and of course I think my own is the best; second, the milliamperemeter, which measures the current actually passing through the X-ray tube; and third, Holzknecht's chromo-radiometer. By the use of my radiometer we determine the number of thicknesses of tin foil (100 square inches to the ounce) which the X ray will penetrate. This furnishes a mathematical measure of the proper quality of radiance, and enables us to profit by our own recorded thousands of applications of the X ray and also by the published reports of other workers. The milliamperemeter invented last summer simultaneously by Griffe of Paris and Snooks of Philadelphia gives us a measure of the intensity of the radiance by mathematically indicating the quantity of electricity passing through the X-ray tube. Holzknecht's chromo-radiometer determines mathematically the quantity of X ray to which the patient is exposed. It consists of a color scale and little sensitized wafers, one of which is placed near the part to be treated, and the X ray is applied until the test object has assumed the required color. No. 1 of the scale represents one-third the amount of exposure required to produce by a single exposure a visible reaction upon the skin of the face. No. 4 is the amount usually applied in the treatment of cancer. In this connection I may mention the dental fluoroscope which I have devised for the immediate examination of the teeth with the X ray.

In regard to diagnostic value, I can only add to what Mr. Satterlee has said, by offering the pictures which show the following cases: One is a case of myxosarcoma of the jaw, which I operated upon at St. Bartholomew's clinic. The picture shows the complete absence of bony structure which characterizes this disease; a probe is seen in the fistula, and this led the patient to present herself for treatment. Had the case been one of necrosis the picture would have shown bony detail only a trifle less dense than normal bone.

The other radiograph illustrates the diagnostic value of the radio-stereoscopic method. The picture shows the region of the upper and lower molars, the angle and parts of the ramus and body of the mandible. Almost all the teeth bear gold crowns, shown in the radiograph by the very dark masses. The teeth on the opposite side show faintly in perspective; the styloid process is remarkably clear; the dorsum of the tongue can be seen making a semicircular sweep upward and forward from the level of the mandibular angle. The picture was made to show the detail in the jaw, and it will be noted that the combined view of the two pictures in the stereoscope gives a much better idea of the structure of the bone than either of the pictures alone. I think the value of the stereoscopic method, which, as Dr. Satterlee says, is a new one, is going to lie chiefly in the study of the maxillæ and their pneumatic sinuses, and that it will not often be required in the examination of the teeth.

The X ray furnishes the best method for discovering the presence and extent of caries, either of the crown or especially of the root of a tooth; an abscessed root; an imperfect root-filling; the presence or faulty position of unerupted teeth, the latter sometimes causing pain by pressure upon adjacent teeth, as in the case of impacted third molars, or in other cases causing displacement of the tooth pressed upon; the extent to which absorption of an implanted tooth has taken place after the lapse of years. These are among the conditions found in recent cases referred to me for examination.

The therapeutic use of the X ray about the mouth is chiefly applicable to two conditions: pyorrhea alveolaris and malignant disease. The cases of pyorrhea alveolaris which I have treated have invariably shown improvement, the pain has been relieved, and the offensive condition has disappeared. A cure has been accomplished in cases in which the disease appeared to be chiefly of the ulcerative type, but in the other cases, in which the gums appear white and cartilaginous, it has seemed as though the X ray would carry them just so far, and that the outdoor exercise and tonics would do more than local treatment.

I have brought with me this evening the photograph of a lady seventy-five years old, who has an epithelioma of the entire roof of the mouth, the gums, and the adjacent mucous membrane of the lip and cheek. There is an hereditary history of cancer, but in her case it was brought about by the pressure of an ill-fitting plate. A pedunculated tumor had been excised from the labio-gingival fold, and the microscopic diagnosis of cancer made; but the surgeon considered the removal of the entire growth a physical impossibility. X-ray treatment was begun a year ago, and has held the growth in check. The patient's general condition has very much improved in consequence of the relief from pain, which has enabled her to eat regularly. Before treatment she was obliged to live on liquids. The entire mass presented a mulberry appearance, being covered with little white knobs.

For pyorrhea I employ my own X-ray tube, which is opaque to the X ray except at the end of a cylindrical prolongation, which is applied directly to the gums.

The usefulness of the X ray in dentistry makes it necessary that the dentist should know what dangers have attended it in the past, and how they are avoided at present. At first very much longer exposures were required, and very little was known about the effect produced by different qualities of radiance. Nowadays we use one quality of X ray when we wish to produce an effect upon the tissues, as in pyorrhea and cancer, and quite a different quality in taking a picture without producing any effect at all upon the tissues.

Certain very definite rules should be observed in X-ray examinations:

(1) The tube should always be incased in a Friedländer shield, made of material opaque to the X ray except at an opening two and a half inches in diameter. This prevents the X ray from reaching any part of the patient except the parts about the mouth.

(2) The anticathode or disk in the tube from which the rays radiate should be ten inches from the nearest exposed surface of the patient.

(3) The vacuum should be medium, the primary current ten amperes, the time of exposure (for Seed triple-coated-process emulsion films) twenty seconds, and the number of exposures of different parts of the face not more than six in any one day.

(4) These rules are for the best apparatus, and for the specified brand of

films. If less sensitive films are used, and the individual exposures are longer, the limit as to the number of exposures is reduced. If stronger or weaker currents are used, the time of exposure must be correspondingly modified.

(5) The above standards should, however, be adhered to if practicable. In my own practice they have proved to be safe, and have given satisfactory results.

Dr. A. M. **Birkhahn.** As my knowledge of the theory and technique of radiography is limited, I will not attempt to discuss the paper of the evening, but merely comment briefly on some of the more interesting cases presented to you by Mr. Satterlee from a clinical standpoint, as they came under my personal supervision, either in my private practice or at the clinic.

Case No. I. Miss R. F., age twelve. The patient presented herself at the clinic for relief. Upon examination I found an epulis apparently springing from the gingival border on the approximal surface of the lower left first molar. The neoplasm was pedunculated and encroached upon the second bicuspid, which it overlapped. Its growth, according to the parents' statement, was very slow. The epulis was diagnosed as fibroma of benign character, and upon suggestion of Prof. Weisse, Mr. Satterlee obtained a radiograph of the affected part before the tumor was removed. It showed the base of the growth springing from the peridental membrane. The tooth, a devitalized one, had a large occlusal cavity. It was decided to extract it, and upon doing so the epulis came along with it.

Case No. II. Miss R. K., age nineteen. The patient presented herself at my office for treatment in November 1900. I inserted several fillings, and also extracted the roots of the upper left first molar. The removal of the lingual root was followed by a copious flow of pus. I syringed the sockets with hydrogen dioxid and had the patient return the following day. I found that the discharge still continued, so introduced a probe into the sinus, which I found to extend about one inch upward. I questioned the patient closely, but could not get any symptoms pathognomonic of involvement of the maxillary sinus. (On examining the radiograph obtained of the case later on, I found a distinct light area, showing that the sinus had been involved at some previous time; but that may have taken place years ago, as the patient did not remember it.) I curetted the socket, syringed it out with a mercury bichlorid solution, and gave the patient a minim syringe, with instructions to flush the sinus with an antiseptic solution three or four times daily.

The patient reported in a week, and I found conditions considerably improved. I directed her to continue the treatment for another week and report again, but that was the last I saw of her until April 1904. She applied for relief from severe pulpitis in the lower left third molar. After checking the odontalgia, I examined the patient's mouth, and to my great surprise found that the old cloaca was still there, and discharging. I asked her whether she was doing anything for it, or whether she thought she was to carry that abscess for the rest of her life. She told me she had been syringing the abscess regularly three times a day since I saw her last, and had no discomfort as long as she kept it up; but as soon as she neglected the treatment, the discharge would reappear.

Suspecting the neighboring teeth as the cause of the trouble, I requested Mr. Satterlee to obtain a radiograph of the affected part. This he did, and it showed the following conditions: The root of the second bicuspid appeared to be surrounded by an area of disintegrated tissue, the exact plane of which could only have been ascertained by a stereoscopic radiograph similar to those shown this evening, but not in use at that time. I then suspected a devitalized pulp in that bicuspid to be responsible for the condition. As the tooth was covered with a crown, I had no means of ascertaining whether it was dead or alive. On the patient's next visit I drilled through the occlusal surface of the gold crown, through the enamel, and a short distance into the dentin, when I had to stop, as the patient complained of pain. I closed up the cavity temporarily with gutta-percha and ultimately refilled it with gold.

I then requested Mr. Satterlee to obtain a radiograph of the parts farther back, and this showed the following conditions: The third molar was impacted, and rested against the lower part of the second molar. The irritation produced was no doubt sufficient to induce and keep up the chronic inflammation and discharge. The gum around the neck of the second molar was absorbed considerably, and it was only a question of time when the patient would lose the tooth through excessive absorption of the alveolar walls. I thereupon decided to sacrifice that tooth, extracted it, and found the roots absorbed as well. I saw the patient since and found the cloaca closed, and the tissues apparently normal. The latest radiograph shows the tissues in healthy repair, with a great deal of absorption.

Case No. III. Mr. N. W., age twenty-six. The patient gave a history of neuralgia of the right side of his face, followed by swelling of the cheek. He applied poultices to the face and an abscess opened on the gum opposite the lower first molar. The discharge kept up for about two weeks before he called at the clinic. There was also a decided condition of false ankylosis, due, no doubt, to the infiltration of the masseter muscle with inflammatory matter.

The patient was hardly able to open his mouth far enough to permit of a good view of the posterior teeth. They were all apparently in good condition, and the third molar tipped forward—a probe introduced into the sinus could be carried posteriorly about an inch only. Upon percussion, I could not detect tenderness of any of the three molars. I referred the patient to the X-ray department. The radiograph showed the third molar to have caused the trouble, as the abscess track led to it.

My associate at the clinic, Dr. Maurice Green, extracted the tooth under ethyl chlorid anesthesia, and the patient was instructed to syringe the socket with an antiseptic solution. He reported in two weeks with muscles completely relaxed and cloaca closed.

As we are on the subject of X-ray photography tonight, I would add that my experience in diagnosing obscure pathological conditions by the aid of radiography has impressed me with the prime importance of the fact that any practitioner who intends to take up dental radiography for diagnostic purposes had better gain a thorough technical, as well as clinical, experience in X-ray photography before he undertakes the work in question, and not be satisfied with the experience acquired by having seen a few stray cases only.

Where the time required for the instruction in the technique and theory of diagnosis from the X-ray standpoint cannot very well be given, it would in my opinion conduce to the welfare of both the practitioner and the patient to leave the matter entirely in the hands of the X-ray specialist.

Dr. C. Francis Rabell. I wonder if the history of the case of the policeman, who fractured his jaw in the attempt to stop a Sunday baseball game, would be of interest. This man presented himself last August for treatment of a multiple compound fracture of the mandible, one fracture being at the second molar on the right side, the other in the region of the first bicuspid. An interdental splint was made, and placed in the patient's mouth. He came back in a week's time, complaining of an abscess in the region of the second molar. It seemed the fracture had passed through the median line of the second molar, the posterior root of which was the seat of an abscess. The splint was taken out and the posterior root removed. The anterior root was left intact, as there did not seem to be any trouble there. The anterior fracture between the canine and the first bicuspid was doing nicely, and the splint was again placed in his mouth.

About two weeks later, when the patient returned, we found there was good fibrous union at the rear fracture. The anterior fracture was not doing as well. We then lost track of the patient, he having sought the services of another dentist. This dentist stated that the interdental splint was not the right kind of appliance to heal his jaw, and advised him to have it taken out. First a bridge was made between the central and lateral incisors. The ligatures did not hold the ends of the bone permanently; the abscess further developed, and necrosis set in. About two months later, he presented himself at Bellevue Hospital, and they performed an operation, removing a section of bone from the second bicuspid to the region between the lateral and central incisors, the bridge being in place. He applied to Dr. Gibson for treatment later on, and Dr. Gibson brought him back to the dental infirmary. When he presented himself there, not knowing what amount of bone had been removed, we brought him to the X-ray department, and Mr. Satterlee obtained the first radiograph which he presented tonight, showing the space between the two ends of the bone—about half an inch in width. The alveolar process had come away in small pieces, the canine being held in position only by the gum and a lateral dummy. After obtaining this radiograph, we saw that the bone had disappeared. We removed the canine, and the dummy attached to it; then I proceeded to wire the jaw together, wiring from the first molar and the second bicuspid on the fractured side across the arch to the canine, and the first bicuspid on the other side. With the assistance of another man, I forced the jaw-bones together, or nearly so, and wired them firmly. We dismissed the patient, and when he returned we forced it farther into position, and wired. Then Mr. Satterlee secured another radiograph—thrown on the screen tonight—which shows that the two ends of the bone are in contact. Caps were swaged and cemented in position, and the patient dismissed. Two weeks later, the man again appeared, and we found that the occlusion had been destroyed, only the posterior molars on either side occluding with the teeth of the opposite jaw, the splint having been loosened. We found on removing it that fibrous union had taken place, and it looked as if it were going to heal nicely. Caps were then made, to build up the lower teeth so as to secure occlusion with the upper ones.

Dr. JOHN I. HART. I want to ask Mr. Satterlee, through the chairman, whether he has found the X ray of diagnostic value in suspected cases of pulp-stones—whether the line would be sufficiently defined to show pulp-stones.

Mr. SATTERLEE. In regard to Dr. Tousey's discusion: In using the radiometer and similar apparatus for improving the technique, I find that the simpler the technique can be kept, the more success may be looked for. It is to me more important to learn to know the tube that you are working with, as though it were a human person, and to know its whims, in order that with it you may do more successful work.

Every tube has a certain quality, reminding me of the voice, which is different in every person, and it is only by the ear becoming accustomed to the singing of the interrupters, also the light in the tubes, that you can learn to know it. I believe, therefore, that by trusting to the senses we get more perfect results than by encumbering ourselves with costly as well as complicated and delicate apparatus.

In regard to pulp-stones, I have not been fortunate enough to secure a case for dental radiography. I presume we can outline them just as well as we can outline secondary dentin in teeth. If anyone has a case of suspected pulp-stones, I should appreciate very much a chance to give it a trial, and we can demonstrate then whether it will show or not.

President HATCH. The chair will take the liberty of thanking the essayist and Dr. Starr jointly, as well as those who took part in the discussion, for the interesting evening we have had.

Adjourned.

B. C. NASH, *Secretary.*

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY
EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, MARCH 1906.

EDITORIAL DEPARTMENT.

HENRY MARTYN LEWIS.

AMONG the influences concerned in the upbuilding of dentistry, as also of any other important sphere of human activity, there are always certain effective agencies at work which are recognized only when accident or some unusual circumstance brings them into view. The Editor of the DENTAL COSMOS, after many years of observation from a viewpoint peculiar in the facilities which it afforded, believes that the death of Henry M. Lewis removes one of these inconspicuous yet none the less important factors from among the agencies enlisted in the upbuilding of dental interests. Those who knew him only as a business man knew him imperfectly. It becomes, therefore, a plain duty to record this personal estimate of one who deserves so well of those whose service was his life-work.

Mr. Lewis was one of those business men whose ideals were shaped upon ethical lines. His activities as a business man, his relationship to the Company with which he had been for so many years associated in various capacities, were the more conspicuous features of his career and are those by which he was best known to the dental profession. His ideals were not simply commercial ideals having for their purpose the amassing of material rewards. His views of life, his attitude toward the dental profession, his direction of his business affairs, were based upon the higher altruistic conception of service to others, and his greatest service was to dentistry. This impulse colored all of his thoughts, all of his acts. The occasional criticisms of those who failed to recognize the significance of his deeper life-motives, and consequently measured his acts only by selfish standards, while they pained him, nevertheless always stimulated him to more energetic endeavor to make his life-record the practical refutation of such unjust estimates. Many who have come to him with personal grievances have left him in gratitude for the better insight into the generous and large-minded character which the interview revealed and for the sympathetic friendliness thus engendered.

The circumstances of his business relations debarred him from personal participation in the official life of the dental profession, yet his personal interest in all that concerned its welfare was deep and genuine. This same interest kept him in touch with the current literature of dentistry, and his information as to the activities throughout the world of dentistry tending to its progress was extensive and accurate. It was his frequently expressed belief that the interests of the dental profession and those of which he was the official head were interdependent, and that the progress of both must be founded upon mutual helpfulness. This belief determined his personal attitude toward dentistry and its representatives, as well as his policy in the direction of the business interests committed to his care. In all instances and under every set of circumstances when his judgment was called upon in the adjustment of relations between profession and business, his decisions were characterized by an unswerving adherence to justice and by equity to both.

His character was expressed in many acts of practical helpfulness known only to the recipients; no appeal failed to bring a hearty response from him when it came to him with the assurance of its genuine worthiness. Within the last half-hour of the day which closed his active business career he asked permission to do a liberal part in substantially helping an unfortunate and worthy member of the dental profession unknown to him personally, and at the same time he expressed his pleasure and gratification at the opportunity to do this kindly act. There are many individuals in the dental profession, and many efforts which the dental profession has made toward the promotion of its interests and welfare, that have received encouragement and substantial help from the liberality of Henry M. Lewis; in these he was and always will be, by his own desire, the unknown and unrecognized benefactor. He was indeed not of that class that "do their alms that they may have glory of men." So inherent was his modesty and so genuine his repugnance to self-glorification that the depth of his sympathy with human distress and his active helpfulness of the needy were known only to those with whom the necessities of the case brought him into contact. It has been the good fortune of some to know well this side of his character through long years of service in the interests of which he was the chief officer, and these knew him not only as a corporation president, but in the more intimate relation of a wise counselor, a dependable guide, a sympathetic and helpful friend—even as one who in no small degree was to them a father, whose advice was always sympathetically given and whose helpfulness was his guiding motive.

In his business relations, wherever they found expression in the policy of the Company of which he was the official head, there was evident his loyalty to the ideals which were the motives of its founder. His admiration for the character of Samuel S. White amounted almost to hero-worship; their intimate friendship engendered a mutual regard which in all the years subsequent to the death of Dr. White continued to ripen and reflect itself in the policy and methods of Mr. Lewis. Both men were professed Christians, though of different sectarian relation, yet both were alike in the important characteristic that they carried their religious principles into the affairs of their daily lives, as a religion of works as well as of faith. Simple-hearted, modest, self-forgetful, charitable not only in material ways but in his attitude toward the erring, always a firm believer in the divinity that doth hedge a man, and always ready to help that divinity work out its destiny of regeneration in the fallen; earnest, honest, actively aggressive in the promotion of the good, true to his trusts, he increased the talents confided to his care. He has earned his reward, and to those who knew him, even in their sense of personal loss there is the sense of gratitude, of thankfulness, that in no small degree there was accorded to him a foretaste of the eternal recompense in the admiration, the honest regard, the love, felt for him while he was yet here.

DENTAL HISTORY.

The Committee on Dental History created some years ago by the National Dental Association was assigned a difficult and tedious task. The making of an historical record reliable and authentic is necessarily a work of slow growth. The collection of data is in itself a stupendous undertaking and one requiring years of effort and painstaking search for the material out of which an historical record may be built. Then a no less difficult problem presents itself in the weaving of this mass of disconnected data into an historical whole. To carry out such a work to a satisfactory conclusion requires a fortunate and peculiar combination of circumstances, and, above all, the enlistment of those who have not only special qualification for this kind of research, but who have also a sustained enthusiasm as a motive force in carrying it out.

The history of dentistry presents a well-defined line of demarkation separating it into two major phases or periods, viz, the establishment in the year 1839 of the three essential factors in professional organization — the association, the college, and the journal respectively. Previous to the date referred to there was no dental profession, as that phrase is now used, but there was much dental history, reaching back, as has been said, "to the mists of antiquity." All of that period previous to 1839 may well and justly be regarded as one of preparation for the professional birth which was to follow, and no one can clearly or correctly appreciate the significance of the professional birth of 1839 unless 'he has familiarized himself with the steps of development during that period, which was the protoplast of our professional life.

It is eminently right and fitting that the task of presenting this formative stage of our history should be undertaken and carried out by a European. First, because it was in Europe that what we now know as dentistry had its beginnings. Secondly, it is in Europe that the available material at command for the preparation of the early history of dentistry is mainly located.

Dr. Guerini of Naples has devoted much labor and time to the collection and arranging of a large mass of dental historical material into connected order, and the result of his work, translated into English, he has generously placed at the disposal of the American Dental Association, under whose auspices the work will be published when a sufficient number of advance subscriptions have been received to warrant the cost of publication. We commend this project to the sympathetic consideration of our readers everywhere. The interest in dental history is a growing one, and constitutes one of the encouraging evidences of professional growth. No man can appreciate the immense advancement made in dentistry, nor can he develop for his professional work the full respect to which it is inherently entitled, unless he have a fair knowledge of the forces and activities which have brought about its present honorable status. Dr. Guerini's history is the most compendious work on the subject, it has been a labor of love and enthusiasm, and the dental profession, in whose interest it has been written, should assure its prompt publication by at once subscribing for the number of volumes needed to finance the publication.

A detailed announcement of this work by the Committee on History of Dentistry of the National Dental Association will be found at page 368 of this issue.

BIBLIOGRAPHICAL.

TRAITÉ THÉORIQUE ET PRATIQUE DES COURONNES ARTIFICIELLES ET DU BRIDGE WORK.

THEORETICAL AND PRACTICAL TREATISE ON CROWN AND BRIDGE WORK. By GEORGE A. ROUSSEL, D.D.S. With 1173 Illustrations. Paris: Octave Doin, 1906.

The progress achieved by the specialized branch of prosthetic dentistry which the author has so exhaustively treated in the work under consideration, may readily be appreciated when it is considered that his compilation in logical and harmonious sequence of the multifarious methods, inventions, devices, and suggestions bearing on the construction and assemblage of crowns which have been brought forth since the introduction of the first pivot crown by Pierre Fauchard in 1728 or thereabouts up to the present day, covers in the neighborhood of eight hundred large octavo pages. The author has treated the subject in a creditable manner and has well succeeded in presenting to his readers in simple, yet forceful and explicit language, a complete and accurate picture of the present status of crown and bridge work.

His literary efforts, as embodied in the present book, must in addition enjoy the distinction of constituting in text-book form the first complete presentation in the French language of our present aggregate knowledge on the subject of crown and bridge work, and the problems with which this specialty is of necessity closely allied.

It stands to reason that in a work of this kind, the larger share of its contents must be taken up with the description of methods and inventions of men whose names, while household words with students of dental history, are practically unknown to a very conspicuous majority of practitioners—those who are constantly enjoying whatever benefits such inventions may have been instrumental in bringing about. For reasons which we do not intend to analyze, we are frequently confronted with the disappointing fact, from an historical viewpoint at least, that such contributors to the literature of dentistry are often divested of the honor which by right should accrue to them. In this connection, and in order to quote an instance which we are certain will appeal to all within the professional circle, we cannot refrain from referring to the invention of the rubber dam—that time-saving, useful, and today almost indispensable contrivance which has been, is, and will always be, the source of so much comfort to the patient, and one without which the progress which dentistry has accomplished, would have been greatly handicapped and in some respects completely halted. Yet, it would be interesting to know the number of present-day practitioners familiar with the name of the benefactor to whom the dental profession owes so much.

The true investigator, the one inspired by unselfish and magnanimous motives, does not of course plunge into the deep sea of unsolved problems for the sake of possible reward. His stimulus lies solely in the thought of the good he may accomplish, while the hope of possible rewards is utterly foreign to his motives.

But such an attitude of mind on the part of the prophets of science does not absolve the world from acknowledging the debt due to them, and from rendering homage publicly to their untiring efforts.

We are consequently extremely disappointed to realize that the author has considered it advisable to refrain from crediting to their respective originators many of the methods which throughout the work are not only mentioned, but recommended because of their intrinsic value and practical features.

It does not seem necessary in this review to mention specifically and verbatim the omissions to which we allude. They may constitute the source of much historical confusion in the future, and likewise may have the detrimental effect of conveying to the inexperienced reader the erroneous impression that with the exception of the methods which are properly credited to their originators, those not so credited should be attributed to the author.

If this palpable erroneous conception of the fundamental principles of book compilation were to be modified in a future edition, it would add materially to the value of the book, which in other respects is worthy of praise and of sympathetic reception on the part of both teacher and student. J. E.

DEVELOPMENTAL PATHOLOGY. By EUGENE S. TALBOT, M.S., D.D.S., M.D., LL.D. With 265 Illustrations. Chicago, 1905.

This book is a collection of reprinted articles which have appeared in various periodicals from the pen of Dr. Talbot, and are increments of a general line of work in which that author has been engaged for the past thirty years.

A perusal of these collected reports gives a refreshing sense of the breadth and scope of the field of which dental pathology is an integral part. One may easily differ with the author on points of detail, yet taken in its more general aspect his attitude must be accorded a respectful attention because of the successful result of his effort to relate those nutritional and structural aberrations from the normal which we call pathological with the more general evolutional movement of biological phenomena, and to correlate our knowledge of special conditions with the great underlying principles of life activities. We are thus taught to understand that pathology is essentially a relative term, and that what in a given environment may be physiological would in another be pathological—a view held by other accepted authorities who are workers in allied fields; for example, by Bland Sutton, Woods Hutchinson, Roux, and others.

Dentistry needs the broadening effect of this larger scientific attitude of mind toward not only its pathological problems but toward all of its problems, and Dr. Talbot's book will tend to such development, if for no other reason than that it furnishes the evidences of the inherent utility of that point of view. The book should be read by all who are interested in the larger relationships of dental pathological problems.

BOOKS AND PAMPHLETS RECEIVED.

Précis de Radiographie Dentaire. By M. René Darmezin. Paris: Vigot Frères. 1905.

Zahnverderbnis und Speichelbeschaffenheit. By Dr. C. Röse. Leipzig: Augustus Pries. 1905.

Beitrag zur Frage von der Kittsubstanz der Schmelzprismen. By Zahnarzt Hjalmar Jungner. 1905.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*L'Odontologie*, Paris, January 30, 1906.]

A FEW EXPERIMENTS WITH ALYPIN. By Dr. L. Camus, Professor at the École Dentaire, Paris.

This newly isolated local anesthetic is being hailed by a number of continental practitioners as a succedaneum of cocain, stovain, and the other agents of the analgesic group. Weak solutions anesthetize the cornea; in two per cent. solutions it is innocuous when applied to the visual structures; it anesthetizes the mucous membranes when rubbed upon these surfaces and also the skin when hypodermically injected.

From the experiments carried on upon dogs, the author is enabled to state that in some cases the fatal dose does not exceed 0.035 gram of alypin per kilo of body weight, an amount about equal to the fatal dose of cocain which has been found to vary between two and four centigrams. It was found on the other hand, that a non-fatal dose of alypin of one centigram caused in the animals experimented upon a series of toxic phenomena similar to the poisonous effects exhibited by cocain. A dose of five milligrams per kilo of body weight causes invariably a decrease in blood pressure; one of ten milligrams, besides further decreasing the blood pressure, inhibits cardiac activity and increases the amplitude of the pulsations, while a dose of twenty milligrams rapidly decreases blood pressure and soon causes death.

The cardio-vascular action of alypin should not be looked upon as a barrier against its use, inasmuch as the effect of five milligram doses per kilo of body weight is neither marked nor persistent, the blood pressure becoming normal inside of five minutes. Furthermore, as has been pointed out by the originators of alypin, the cardio-vascular action can be greatly modified by the addition of a small amount of an adrenalin solution to the anesthetic mixture. The general toxicity of the agent should not constitute a source of any great anxiety, when it is considered that in the most unfavorable experiment of the series above referred to, the symptoms were very similar to those caused by cocain. The dose of five milligrams per kilo of body weight with which the author experimented, and which does not give rise to convulsions or to any other dangerous manifestations, would be equivalent in the case of an adult of average weight, to a dose of from 0.30 to 0.35 gram (gr. v to vj), or in other words, to from 15 to 17 cc. of a 2 per cent. solution.

In concluding the author adds that his experiments were performed by injecting the several doses of alypin directly into the circulation through the femoral vein, a method which is never employed in surgical practice, and one which induces quicker and more active results than the ordinarily employed hypodermic method.

[*Deutsche Zahnärztliche Wochenschrift*, Berlin, January 1906.]

FACIAL PARALYSIS FOLLOWING THE EXTRACTION OF A NUMBER OF ROOTS. By Zahnarzt Jos. Zimmer, Greifswald.

The author extracted under chloroform anesthesia sixteen dental roots from the mouth of a woman thirty-eight years of age, of robust constitution and good antecedents. With the exception of seven upper roots, the remaining ones were removed without difficulty, and without subjecting the tissues to any degree whatever of extra strain.

A few days after the removal of the roots, the patient began to develop symptoms of facial paralysis, and eventually presented a correct clinical picture of Bell's palsy. While Zahnarzt Zimmer is inclined to attribute the cause to influences independent of the extraction, it is noteworthy, however, that the paralysis developed upon the side of the mouth from which the seven difficult roots were removed, and it is not improbable, in the reviewer's opinion, that through the many branches of communication between the fifth and seventh nerves, the latter may have been indirectly injured, although the injury must have been extremely slight, inasmuch as the patient easily recovered the use of the structures involved in a typical case of facial paralysis. Bell's palsy is usually the result of some injury to the facial nerve, either from accidental wounds of the face, or during some surgical operation, as removal of parotid tumors, opening of abscesses, or operations particularly on the lower jaw.

In the case under consideration the successful treatment consisted in eight applications of a weak galvanic current.

[*Archiv für Zahnheilkunde*, Berlin, January 1906.]

THE TREATMENT, WITH LEAD, OF ENLARGED FORAMINA AND PERFORATIONS. By J. H. Spaulding, D.D.S., Paris, France.

In those cases in which the apical foramina have been enlarged, or the walls of root-canals have been perforated traumatically by caries or otherwise, the author advocates lead as the filling material *par excellence*. His experience with this material covers a period of twenty-eight years, during which time he has successfully treated a number of cases of perforations through the walls of root-canals and at the bifurcations by sealing the apertures with lead.

It seems likely that either the lead becomes encysted in the tissues as in the case of lead balls, or the lead salts formed at the end of the root are such as to maintain healthy and aseptic conditions. The latter hypothesis seems to the author to be the more probable.

In concluding, the author states that lead is more easily tolerated in contact with the periosteum, or other sensitive tissue, than any other material. This fact makes the saving of perforated teeth comparatively easy, and facilitates the treatment of alveolar abscesses, of whatever nature, by permitting a free opening of the foramen for such treatment without fear of subsequent trouble after it is closed.

[*Deutsche Monatsschrift für Zahnheilkunde*, Berlin, December 1905.]

DENTAL CARIES AND THE NATURE OF THE SALIVA. By Dr. C. Röse.

The essayist has analyzed specimens of saliva from two hundred and nineteen children of an average age of thirteen years. He has thus been enabled to confirm the observations of other investigators to the effect that the prevalence and increased development of caries occurs simultaneously with a decrease in the alkalinity of the saliva. Normal saliva is of alkaline reaction, and under ordinary circumstances, 100 cc. of saliva should be equivalent in alkalinity to 15 cc. of a potassium decinormal solution. Healthy saliva of high alkalinity evolves a penetrating odor comparable to that of chestnut blossoms.

The essayist has carried on a considerable number of experiments to determine the means by which slightly alkaline or acid saliva may be modified so as to render its reaction decidedly alkaline, inasmuch as through his very careful observations he has been able to determine, with a reasonable degree of accuracy, that saliva of high alkaline reaction constitutes in itself the best means of combating the development and progress of caries. He has found that a diet consisting of foodstuffs rich in calcium salts increases the alkalinity and the quantity of the saliva. Dr. Röse believes that such a diet influences favorably the quality of the teeth, and that the good effects, while not immediate, are by all means detectable in the superior quality of the teeth of future generations.

[*Dental Brief*, Philadelphia, February 1906.]

THE USE OF VERTICAL CLASPS FOR THE RETENTION OF PARTIAL DENTURES. By I. B. Davenport, M.D., D.D.S., Paris, France.

The clasp may consist of a single wire or loop of wire, or a narrow strip of plate of springy material shaped to the tooth. It is attached to the plate opposite the neck of the tooth which is to serve as support, and extends vertically toward the masticating surface of the tooth. It may be further extended so as to form a hook, which resting upon the masticating surface of the tooth, would serve the additional purpose of preventing the plate from settling too hard upon the soft tissues. The vertical clasp is of the greatest use in cases of long teeth, and those of conical shape rapidly narrowing toward the gums, and especially for those cases where the space caused by lost teeth has been partially closed by the tipping of the adjoining teeth, leaving a wider space at the gums than away from it.

The author discusses the advantages and disadvantages of the horizontal and vertical clasps respectively, stating that the vertical clasp method need not be employed in cases in which the clasp has to be fitted to short teeth with parallel surfaces. The two kinds of clasps may be adapted to the same plate, when the conditions on one side of the mouth differ from those on the opposite.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde,* Zürich, October 1905.]

THE OSTEOCLASTS IN DENTAL CARIES: PROCESS OF TOOTH-DESTRUCTION AT THE CARIOUS ZONE. By Drs. Coyne and Cavalié of the Laboratory of Pathological Anatomy of the Faculty of Medicine of Bordeaux.

The examination of microscopical preparations of carious teeth (caries of the dentin) have enabled the authors to detect in the zones of decalcification and destruction, a number of multinuclear cells presenting the characteristics of osteoclasts (myeloplaques of Robin; megacaryocytes).

The authors divide a carious region into four different zones: (1) The zone of destruction; (2) the zone of decalcification; (3) the opaque zone; (4) the transparent zone. In the first two, they have plainly detected the presence of osteoclasts. These cells, the authors believe, participate in the disintegration of the tissues of the tooth, and play an important part in the carious process.

[*New England Medical Monthly,* January 1906.]

CALCULUS IN WHARTON'S DUCT COMPLICATED BY SUPPURATION WITH INVOLVEMENT OF THE SUBMAXILLARY AND SUBLINGUAL GLANDS. By M. D. Lederman, M.D., New York.

The author reports the case of a patient aged eighteen, who complained of difficulty in swallowing and inability to open the mouth to any extent. Deglutition, which was very painful, had prevented the patient from eating solid food for several days. He had a similar but milder attack three years previous, when a small concretion was removed from the sublingual region. No cutting had been necessary to liberate the calculus during the first attack. The patient's external appearance resembled the clinical picture of an advanced quinsy. The intra-oral tissues were decidedly swollen, also the tissues from the mandibular angle on the left side to the submental region. The submaxillary and sublingual glands were swollen and very tender to pressure. Pus was seen in the opening of the papilla through which Wharton's duct empties. A slender probe was introduced into this orifice, and having passed a distance of an inch, its progress was arrested by some hard substance. The temperature at the time was 102⅗° F., pulse 110.

Under cocain anesthesia an incision was made into the sublingual tissues, and a calculus three-quarters of an inch in length, and one-quarter of an inch in thickness was removed. It had evidently occluded Wharton's duct and had obliterated, for the time being, Bartholin's duct where it enters the former channel. The inflammation had spread, involving the submaxillary and sublingual glands, the parenchymæ of which had become the seat of severe pyogenic infection, and consequent suppuration. Treatment based upon strict cleanliness and antisepsis soon eradicated the pyogenic inflammation, and the wound having healed nicely, complete recovery ensued promptly.

.[*Dental Record,* London, February 1906.]

ALLOYS AND AMALGAMS. By F. J. Brislee, M.Sc., Liverpool, England.

The author submits the following conclusions, which it is his belief should be observed in order to obtain satisfactory results with amalgam when used as a filling material:

First: The alloy should be mixed with a definite quantity of mercury, and under no conditions must excess of mercury be used necessitating the removal of the excess by squeezing.

Second: Pure mercury must be used.

Third: The alloy from which the amalgam is prepared should be as homogeneous as possible, and the alloy and mercury should be thoroughly incorporated by rubbing in a mortar.

Fourth: Fillings in the same mouth should not be of very different composition, otherwise electrical action will occur, which results in pain to the patient and disintegration of one of the fillings.

This electrical action is brought about by the two fillings of different metals acting as electrodes, the saliva as the electrolyte and the nerve as the external circuit. The electromotive force of the combination will be greater, the greater the distance separating the two metals in the voltaic series, viz, Zn, Cd, S, Cu, Hg, Ag, Au. Thus, if two teeth contained a copper amalgam and a gold filling respectively, the copper would form the negative pole, and the gold the positive pole of the combination. The potential difference would be considerable, and since the combination has in all probability a low internal resistance, the current strength would be fairly high, giving great possibilities of pain to the patient. On the other hand the copper amalgam would dissolve, some of the copper being deposited upon the surface of the gold filling.

[*Deutsche Zahnärztliche Wochenschrift*, Berlin, December 16, 1905.]

THREE THERAPEUTIC AGENTS. By Zahnarzt Dr. Max Lewin, Leipzig, Germany.

After reviewing the literature of vioform iodochloroxychinolin, Dr. Lewin reports its successful application in the treatment of a number of dental diseases. Thus he employs it in the after-treatment of extraction, particularly in the case of alveoli from which the teeth were difficult to extirpate. For this purpose he introduces into the socket a dressing of vioform cotton, which is prepared by treating sterilized cotton with a ten per cent. solution of vioform. Its use is likewise indicated in the treatment of wounds and ulcerations of the mucous membrane of the mouth, applied locally; in the treatment of infected root-canals, being for this purpose an ideal substitute for iodoform; for capping pulps, it being applied in the form of a paste obtained by incorporating the agent into the cement-mix ordinarily employed for this purpose.

The second therapeutic agent upon which the author reports favorably is aspirin, which he administers internally in cases of odontalgia through pulpitis and pericementitis; to subdue the pain which frequently follows the application of arsenic for the purpose of devitalizing the pulps of teeth; in cases of neuralgia and whenever the nervous system is so overwrought as to require a harmless and at the same time reliable sedative agent.

The third agent mentioned by the author is trichloracetic acid, which he hails as a *nonpareil* in the treatment of inflammatory conditions of the oral mucous membrane, pyorrhea alveolaris, etc., when mixed with water in the proportion of five parts of the former to two of the latter. Being an active escharotic it must be used cautiously, applying it lightly upon the inflamed or hypertrophied areas by means of an orange-wood stick. All excess of acid should be rinsed off by means of water.

[*Dental Record*, London, February 1906.]

EXPLOSION WITH SODIUM DIOXID. By J. W. Lloyd.

At the meeting of the Liverpool District Odontological Society, Mr. J. W. Lloyd referred to an explosion that had occurred in the mouth of a patient during the use of sodium dioxid for the cleansing of a septic root-canal. He had dipped a broach wound with cotton into the sodium dioxid, and upon introducing it into the canal a violent explosion occurred, much to his surprise and to the alarm of his patient.

[*Semaine Médicale*, Paris, November 29, 1905.]

FATAL INTOXICATIONS WITH SMALL DOSES OF POTASSIUM CHLORATE. By Dr. Albrecht, Vienna, Austria.

The author reports the case of a boy who after suffering from an attack of varicella and one of rubeola complicated with intestinal catarrh, was treated for stomatitis with doses of potassium chlorate of 0.50 gm. (7½ grains) *per diem*. Upon the second day of the potassium treatment the patient collapsed and never rallied. At the autopsy it was found that the liver had been the seat of fatty degeneration and the viscera and blood were of a deep brown color. This patient's intolerance to such a comparatively small dose was doubtless caused by the condition of the liver, as the maximum dose of potassium chlorate in children is 3 grams (45 grains), and in adults 8 grams (2 drams).

Dr. Shopf has recorded another case of fatal potassium chlorate intoxication in a man aged twenty, brought about by the use of a gargle of which the agent in question was the principal ingredient, but as an antithesis to this, Grünfeld mentions a case in which a patient swallowed a dose of one-half ounce of potassium chlorate without any deleterious symptom supervening.

[*New York Medical Journal and Philadelphia Medical Journal,* New York, December 9, 1905.]

AVULSION OF THE TERMINAL BRANCHES OF THE TRIGEMINAL NERVE FOR THE CURE OF TRIFACIAL NEURALGIA. BY ERNEST LAPLACE, M.D.

In order to avoid the failure in operations for trifacial neuralgia which results through regeneration of the nerve across the narrow excised portion, Laplace has conceived and successfully carried out the plan of avulsing the entire nerve even to its most peripheral branches.

After exposure of the nerve, it is caught in a special curved hemostatic forceps; the forceps are now gently turned from left to right, winding both approximal and peripheral parts of the nerve upon itself. This must be done so slowly that a single turn of the forceps will require two minutes. The nerve gradually yields, and the winding is kept up until it breaks. It takes from twelve to twenty minutes to obtain this result. The author reports four cases thus operated on in which up to the present there have been no recurrences.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde,* Zürich, October 1905.]

THE PRESENCE OF NON-STRIATED MUSCLE FIBERS IN THE PULPS OF THE FIRST AND SECOND MOLARS. BY DRS. COYNE AND CAVALIÉ OF THE LABORATORY OF PATHOLOGICAL ANATOMY OF THE FACULTY OF MEDICINE, BORDEAUX.

The dental pulp may be said to be composed of three varieties of tissue, viz, the external odontoblastic layer, the central embryonal layer, rich in bloodvessels and nerves, and the layer of stellate cells. The authors have detected in the pulps of the first and second molars which they have examined, a number of non-striated muscle fibers lying between the central and stellate layers.

PERISCOPE.

Worn-out Mandrels.—Worn-out screw mandrels will hold a stone nicely by using a little soft cement on the screw in putting it in place.—F. B. JAHR, *Western Dental Journal.*

Watch Crystals as Medicine Containers.—A number of discarded watch crystals, obtained from your jeweler, are very useful for small mixes of medicine and other preparations.—A. C. WILLMAN, *Dental Review.*

To Secure Proper Closure.—In setting up the teeth for a full denture, after the incisors and canines are in place, open the articulator about one-thirty-second of an inch; this will bring the pressure of the bite on the bicuspids and molars where it belongs.—*Western Dental Journal.*

To Obtain a Roughened Surface for Porcelain Inlays.—For obtaining the roughened surface of porcelain inlays, coat the floor of the matrix with a thin layer of asbestos powder.—M. D. LITTIG, *Dental Summary.*

To Save Time When Re-Striking Up a Plate.—Sometimes it happens that a metal plate is returned to you by the patient badly bent, or perhaps after the bands have been soldered on, the "strike" does not seem perfect. Now instead of removing them, place a little moldine around those teeth (on the zinc die), which the bands fit previously to casting the lead, and you will be able to strike the plate accurately into position without the lead interfering with the bands at all.—A. O. C., *Elliott's Quarterly.*

Local Anesthetic.—The following is an admirable local anesthetic to be used before the opening of boils, felons, etc.: Chloroform, ten parts; ether, fifteen parts; menthol, one part. Spray on part with an atomizer. —*Monthly Cyclopedia of Pract. Medicine.*

To Facilitate the Handling of the Automatic Plugger.—A short piece of rubber tubing slipped over your automatic plugger will make your fingers feel glad. It gives you a better grip, does not become slippery, and thus relieves the fingers of the strain they are otherwise compelled to undergo.—A. C. Willman, *Dental Review.*

Useful Practical Hints.—The suggestions that I give are not all original with me, and in calling them helpful I mean they have been so to me. One is: A common slate pencil is better for teasing solder than an instrument. The solder does not adhere to it and it does not heat up and burn the fingers. It can also be used for stirring fusible alloy.—A. C. Willman, *Dental Review.*

To Restrict Flow of Solder.—In soldering gold, when it is desired to restrict the flow of solder to certain areas, with a sharp lead pencil draw a line around the desired area; the solder will not flow past the line. This is especially valuable in filling cusps of seamless crowns, to prevent the solder flowing up the sides of the crown.—F. W. Franklin, *Western Dental Journal.*

Repairing or Adding Teeth to a Plate.—The following is a quick way of repairing or adding teeth to a vulcanite case. Instead of pouring wax on the cast where the repair or addition is needed, place rubber on it by means of a hot clean spatula. This may be entirely buried in the plaster when flasking, and immediately placed in the vulcanizer. I have never had a failure, and find it a most reliable method.—S. L. W., *Elliott's Quarterly.*

Contrivance to Facilitate the Waxing-up of Plates.—In waxing-up plates it is very convenient to have some melted wax where you can use it at any time. A small tin cover may be riveted to a wire frame in such a manner as to keep it at the proper height above your Bunsen flame. The one I have is kept three and one-half inches above the flame, and at that height the wax is kept melted and yet does not boil over.—A. C. Willman, *Dental Review.*

Final Polishing of Plates.—In giving the final polish to rubber plates, I find that a polishing wheel made of about twenty-five thicknesses of unbleached muslin gives a better finish than chamois skin or a soft brush wheel. The edges of the circles of cloth become frayed and do not scratch. I can get a finer polish with this kind of polishing wheel than with anything else I know of.—A. C. Willman, *Dental Review.*

Separating Varnish.—While the following formula for separating varnish is not new, it may be unfamiliar to some:

Shellac,	6 ounces;
Borax,	3 ounces;
Water,	1 quart.

Sig.—Dissolve the borax in the water, bring to a boil, and add the shellac.—A. Daughaday, *Western Dental Journal.*

Packing Rubber.—When packing a plate many lay a napkin over a dish of hot water, allowing the steam to soften the vulcanite rubber. The napkin often sags down into the water or slips off, causing considerable annoyance. By stretching a single thickness over a wooden embroidery hoop you have an ideal contrivance. The rubber will not fall off or stick to the napkin, and you will be pleased with the result.—A. C. Willman, *Dental Review.*

Repairing Gum Section.—To repair a broken tooth in a gum section, grind out the broken tooth from the section, even with the gingival margin, then select a plain vulcanite tooth of proper size and shade, and grind to fit the space. Pack in fresh vulcanite around the pins of the tooth and vulcanize as an ordinary repair case. If a little care has been used in making the joint at the gingival line, the job cannot be detected from a full new block.—F. H. Wilkinson, *Dental Summary.*

A Method of Making Inlay to Restore the Corner of a Central or Lateral.—After the matrix is invested in sump and dried, puncture the matrix with an instrument near the cutting edge—which will be the heaviest part of inlay—sufficiently to push through a little way an ordinary pin broken from a vulcanite tooth. After the pin is in and left sticking up in your matrix proceed to build up and bake as usual. Before setting cut enough from tooth to allow room for pin and make an undercut. The inlay will never come out after set, unless broken.—A. C. Greenlee, *Dental Summary.*

Soldering of Aluminum.—Herr Wagner of Berlin recommends the following for soldering aluminum and its alloys: He uses a flux formed of 80 parts stearic acid, 10 parts zinc chlorid, 10 part tin chlorid. Any ordinary soft solder can be employed, but the best is that composed of 80 parts tin and 20 parts zinc. After the dentures to be soldered have been cleansed and passed through the flux, the soldering is done in the usual way.—Z., *Quarterly Circular.*

A Good Coating for Plaster Casts.—To four ounces of sulfuric ether add two ounces of collodion and two ounces of "silver gloss." The latter may be obtained from dealers in painters' supplies, and is put up in one-ounce packages. Let the mixture stand for about forty-eight hours, and shake well before using. Apply with a camel-hair brush and keep in well-corked bottle. This will give a beautiful glossy surface to casts.—J. F. STEELE, *American Journal.*

For Sore and Spongy Gums.—A useful mouth-wash is made with tincture of myrrh, a dram to a tumblerful of water; or tincture of iodin (two to four drams in eight ounces of water) with tannin. Bartholow employed a mouth-wash of one dram of tannic acid, two ounces of honey of rose, and four ounces of water. Davis recommends a weak solution of thymol, boric acid, or carbolic acid; also a weak galvanic current for seven to ten minutes through the parotid and salivary glands.—*Denver Med. Times.*

To Preserve Drugs from the Action of Light.—A prevalent notion is that where there is need to exclude sunlight from a substance, green or blue glass provides a complete solution for the difficulty. As a fact, green or blue glass is without effect in preserving such substances from decomposition by light. The most active rays are the actinic or ultra-violet rays, and these pass freely through green or blue glass which has little or no preservative action on medical substances. Mr. Smith's plea for the use of amber glass is thus based not only on experience, but also on physical considerations. In the paper read before the Sheffield Pharmaceutical and Chemical Society a striking example was given. An aqueous solution of mercuric chlorid, exposed for nine months, gives a copious precipitate in a white, blue or green bottle, but if kept in an amber bottle, gives no precipitate. The list of substances whose keeping properties are materially affected by light is long—longer indeed, than most pharmacists realize.—*Red Cross Notes.*

To Replace Tooth on Vulcanite Plate.—When a plain tooth is to be replaced on a rubber plate, cut out a dovetail in the rubber, back of the place where the tooth is to go. Paint the back of the tooth and the space in the rubber with rubber cement. This is made by dissolving red rubber in chloroform. Place the tooth in position and pack the space with a piece of new rubber, using a warm spatula. Invest and vulcanize. Two or three plates could be invested in one flask, if necessary, as the flask does not have to be separated.—H. T. HARVEY, *Western Dental Journal.*

Silver Nitrate with Cement Fillings.—A cement filling, zinc oxyphosphate, placed upon a surface treated with silver nitrate, will, for some reason, last a great deal longer and will be a great deal better mass than the same mass not having the peculiar effect it gets from this film of silver albuminate. A great many, no doubt, have seen the effect of silver nitrate upon a surface which has been infected to a very slight depth. That in time will become a polished black surface and further decay will never result. Now, if in deeper cavities we can make partial preparation and apply silver nitrate, and have it last longer than otherwise, it is worth knowing.—W. V-B. AMES, *Dental Review.*

A Method of Manipulating a Positive Matrix for Inlay Work.—In describing what I have termed a method of manipulating a positive matrix for inlay work, I always prepare the cavity in such a manner that an impression can be taken that will readily draw. From the impression taken in modeling composition, the matrix is first outlined over it, in order that it may be readily introduced into the cavity without puncturing or warping it, and with sufficient margins all around the border. With cotton pellets and burnishers I thoroughly adapt the matrix to the cavity, and after removing all cotton, force the modeling-compound impression—first taking the precaution to slightly oil it—into the cavity and over the matrix and firmly swage it by use of the fingers and suitable appliances. The impression and matrix are removed and together invested in a small platinum tray, in three parts powdered silex to one of plaster mixed with water to a proper consistence. The investment is practically non-shrinkable, and will withstand the heat for any number of bakings required to complete the inlay. This method gives a matrix that is in positive contact with all the points of the cavity, and eliminates direct handling of the matrix with the fingers or instruments up to the completed inlay.—F. S. MORRISON, *Dental Summary.*

To Wax Together the Fragments of a Broken Plate.—It is often difficult to securely wax together a broken plate, especially a lower partial. The attempt to hold the broken pieces in one hand, while you attach them with the other, makes you wish you had three or four hands. If a strip of wax, such as the dental depots use for mounting a set of artificial teeth, be softened and laid on a flat unyielding surface, a piece of glass for instance, the broken plate may be pressed teeth down into the wax, using both hands to hold the pieces in proper position. When you let go, they will remain in place and you are free to examine carefully, and wax together.—A. C. Willman, *Dental Review.*

Antiseptic Mouth-Washes.—

Carbolic Acid.

℞—Carbolic acid,	2 parts;
Glycerin,	3 "
Chloroform,	1 part.

Sig.—Five to ten drops in a wineglassful of warm water.

Benzoic Acid.

℞—Benzoic acid,	5 grains;
Thymol,	1 grain;
Ol. menth. pip.,	8 drops;
Tr. eucalypt.,	1 dram;
Alcohol,	1 ounce.

Sig.—A teaspoonful to a tumbler of warm water.

Salicylic Acid.

℞—Salicylic acid,	10 grains;
Ess. menth. pip.,	10 drops;
Tr. lavand comp.,	20 drops;
S. V. R.,	½ ounce;
Aquam ad	1 ounce.

Sig.—A teaspoonful to a tumbler of warm water.—*Medical Times.*

Silver Nitrate.—About twelve years ago I began using silver nitrate, at first carefully, as I had some fear of its deep staining properties, but later I used it freely, and for ten years I have made it a rule to see that all the teeth back of the canines were given a good treatment of the saturated solution as soon as possible after eruption. I simply dry off the surfaces and put on the solution with a small swab, letting it stay a minute, during which time I push it with an explorer down into the sulci. I wish to give this as an invariable rule, carried out with great success for this length of time. The staining is only superficial, and caries is generally prevented; in cases where it does occur it is greatly delayed. Teeth given this treatment need as careful watching as if untreated, for in a few cases it seemed that the nitrate did not reach the deep-seated structures, and decay went on without any apparent sign of its presence. Our big operations give a certain satisfaction, but it is not to be compared to that of feeling that we have actually kept the teeth from the ravages of caries.—Harry F. Hamilton, *Internat. Dental Journal.*

Salicylic Ionization in an Obstinate Case of Tic Douloureux.—Professor S. Leduc of Nantes (*La Semaine médicale,* November 22d) reported last year several cases in which he had obtained excellent results in neuralgia by electrolytic introduction of salicylic ions (galvanic cataphoresis). Recently he has again resorted to this method with success in a case of tic douloureux of thirty-five years' standing. It affected all of the right side of the face, and the pain was constant. Frequent crises occurred, which were so severe that the patient lost flesh and his face constantly bore the appearance of acute suffering. He was cured, according to Dr. Leduc, with three treatments of salicylic ionization. The method followed was to apply the cathode, moistened with a solution of sodium salicylate, to the right side of the face, and at the first treatment the current was raised gradually to an intensity of 45 milliamperes and maintained for forty minutes. After the second treatment, which took place three days later (when the current was allowed to pass for one hour, with a current of 35 milliamperes), he experienced marked improvement. The pain now returned only during exposure to cold. Finally, a third and last ionization of forty minutes brought about a final cessation of the pain. From that time the patient's condition has been remarkably improved, and he has regained considerable flesh.—*New York Med. Journal.*

A Method of Making a Gold Inlay.—The matrix must be made of 24-k. gold or 1-1000 platinum. Cut material large enough to cover the inside of the cavity and allow good margins. Place gold or platinum over the cavity and roughly shape, using cotton on end of pine stick. With suitably shaped pine sticks wipe the matrix into every portion of the cavity, frequently annealing to prevent the breaking of the matrix. Remove the matrix and flow into bottom, if gold, 22-k., if platinum, 24-k. gold. Cut a short piece of platinum wire No. 28 gage, shape it like the letter U, hold it at the curve with pliers, and solder the ends into the bottom of the matrix, thus making a loop which may be grasped with pliers to remove the matrix from the cavity. Now take moss fiber gold and pack into the matrix in the cavity as in filling, only not so condensed, to the form desired. Remove the matrix, invest, and flow 22-k. gold, which will sink into the moss fiber and make a good solid surface. Polish the inlay out of the mouth. Undercut cavity and cut grooves in the inlay to grip the cement. Prepare the cement, place in the cavity, put in the inlay, and have the patient bite on pine wood to force it to place. Leave some of the cement around the inlay—if it involves the mesial or distal surfaces—until thoroughly set. When platinum matrix is used, 24-k. gold may be used throughout, making a very beautiful surface, and one quite free from pits.—HENRY BARNES, *Dental Summary.*

Hollow Gold Inlays.—The matrix is formed of a piece of pure gold, No. 36 gage, burnished to fit the cavity. It may be necessary to anneal the gold several times during the burnishing process, but before the last annealing a hole should be punched in the bottom of the matrix with a plate punch, and with sharp-pointed scissors should be cut an opening large enough to admit the passing of pieces of solder. Also trim the edges so that they will extend a trifle beyond the beveled margins of the cavity. Replace in the tooth and adapt to all parts of the cavity, especially the margins, which should be perfectly burnished to place. Remove and flow a little solder around the opening on the concave side and replace in the cavity. Then, if the cavity extends to the approximal surface, use a matrix of metal the thickness of gold to be used for the contour. Take a bite in modeling compound, being sure that it fills the cavity and extends beyond the margins. At this point, if you wish to finish the case at the same sitting, remove the matrix and carve the compound to the required shape. Then burnish a piece of pure gold, No. 36 gage, over this, extending a little beyond the margins all around. Remove both contour and matrix from the cavity. Soften and take out the modeling compound. Paint a little flux on the concave surface of the contour; grasp the same with soldering pliers by the extended margin; hold with the concave side up and drop the matrix into it; with a little manipulation it will go to its place. Drop a little solder through the opening and solder the pieces together at one point, preferably near the cervical margin. The bite may then be proved by trying in the tooth. If it be all right, complete the soldering by holding in the pliers and dropping pieces of solder through the opening and passing slowly back and forth through a Bunsen flame. This method of soldering will answer for the majority of inlays, but a very large one will require different treatment. Bend a piece of wire so that it forms a loop large enough to hold the case, and pass back and forth through the flame as before. After soldering is completed, the margins should be ground down and the final finishing done in the mouth. If it be not convenient to have the patient stay for the completion of the work, the procedure is a little different. Do not use a matrix in taking the bite, but allow the modeling compound to go between the teeth and extend over the margins. Remove the bite and matrix and run a plaster model. When this is hard, carve the modeling compound to the desired contour. Having the imprint of the opposing and approximating teeth as guides, it will not be necessary to use an articulator. The cover or contour gold is then burnished to the model and the inlay is finished as above described.—W. G. CLARK, *Dental Review.*

The Halogens as Antiseptics.—Chlorin, iodin, and bromin, the three most familiar of the four halogens, are strongly bactericidal, and this property has been employed at different times for surgical purposes in various ways. "Chlorid of lime" (more properly, chlorinated lime) has been used as a means of liberating chlorin, for purposes of house disinfection and for the disinfection of the surgeon's hands. Aqua chlori is also used sometimes as an antiseptic eye-wash in purulent ophthalmia. In open wounds the employment of chlorin is very limited. Iodin is a most excellent medium for the sterilization of animal ligatures (Claudius). It is used with happy results in the treatment of indolent sinuses. It is a powerful surface disinfectant. The liberation of free iodin is the antiseptic virtue of iodoform, aristol, and similar compounds. Senn sounds the praises of iodin solution for irrigating and as a dressing for suppurating wounds. But even free iodin, however liberally applied in this form, falls far short of being specific in the local therapeusis of suppuration. In *Surgery, Gynecology, and Obstetrics,* December 1905, H. E. Stroud endeavors to "set forth the value of bromin as an antiseptic of the highest order." He reports two cases—one a foul sloughing wound of the foot, the other a huge carbuncle of the neck and back—in which he employed, with gratifying results, an aqueous solution of bromin in the dressings. The cases are interesting, it is true, but they would be more convincing if it were evident that their cure was due chiefly to the action of the bromin. In one case no other dressing had been intelligently tried and found to fail, and in both cases other surgical measures were also invoked. The volatile bromin solution is so disagreeable to handle that this, in itself, is enough to limit its applicability.

We do not wish to discourage the search for more specific agents for use in the treatment of local infections, nor to belittle the usefulness of antiseptics as adjuncts in the treatment of suppurating wounds; yet, after all, the chief field of the stronger antiseptics is in the sterilization of inanimate objects and in the disinfection of the unbroken skin. In the long run, the best "antisepsis" for infected wounds is found in the surgical application of certain mechanical principles—chiefly that of drainage. This includes the intelligent employment of dressings—by which is meant the selection of the proper form of dressing rather than the choice of this or that dressing solution or powder. For the rest, the antisepsis must be left to the wound tissues themselves.—*Amer. Journ. of Surgery.*

Steps in the Process of Duplicating Plaster Models With Gelatin.—

(1) *Preparation of Model.* Into the surface of the model to be duplicated dust powdered soapstone with a brush assisted by the clean finger; work the powder well into the plaster, the object being to close all pores in the surface of the plaster in order to prevent the gelatin from adhering. Care should be taken, however, to remove all surplus powder from the interproximal spaces, from over the stippled portion of gum, etc.

(2) *Preparation of the mold.* Of course this depends upon the kind of material used. I now use a mold composed of four pieces, a base-plate, five and one-half inches in diameter, with a groove one-sixteenth inch deep, extending around the plate one-fourth inch from the outer margin. Into this groove fits a ring of brass two inches high and one-sixteenth inch thick. The brass ring is made of two parts held together by a metal band. It is assembled very readily and is now ready to receive the gelatin. If a rubber, wooden, or plaster ring be used, it should be placed upon a glass slab and plaster poured around the circumference, uniting the mold to the slab. If this is not done, when the gelatin is poured the mold will rise from the glass and the gelatin will escape and smear everything in sight.

(3) *Preparation of the gelatin.* The gelatin I use is known as sheet gelatin, and is made in Germany. It comes in sheets about three inches wide and nine or ten inches long, and is put up in 1-lb. packages, retailing at grocery stores for about forty-five cents per lb. It takes a full pound to make a mold. Having provided a double boiler, place in the inner receptacle about three or four ounces of water; and into this incorporate gradually the sheets of gelatin, previously dipped in cold water. The gelatin will melt very readily in water, but as little water as possible should be used, for if much be used the gelatin will shrink upon setting and the results will be inaccurate. After the gelatin is melted and has cooled somewhat, add about six ounces of glycerin and stir thoroughly. The glycerin seems to give body to the gelatin and prevents shrinkage; it also keeps the gelatin soft and pliable. If the glycerin be not used the gelatin will lose its elasticity and become exceedingly hard.

Pouring the Gelatin. Place the model in the center of the mold with the cutting edges of the teeth upward. The model should be glued to the base-plate or glass slab with a drop of hot wax. This will prevent it from floating to one side of the mold or rising to the surface when the gelatin is poured. Pour the gelatin, as cool as it will pour, in a direct stream on the surface of the model. If the model be not held firmly there will be less tendency for it to move, if the stream be so directed, than if poured from one side. Pour quite slowly at first to allow the air to be displaced. Fill the mold to the surface and set aside to cool. I like to pour in the evening and allow it to set over night.

Separating the gelatin from the mold. Remove the band which encircles the halves of the ring and the base-plate, which will come away easily. I find it very difficult to remove the gelatin from the other forms of mold. Often it is necessary to break them before the gelatin can be got out.

Removing the model from the gelatin. The gelatin being soft and pliable it can be sprung away from the model, and when the model is removed the gelatin will return to its original shape. The gelatin should be teased away from the mold slowly and easily, to avoid tearing.

Preparation of the surface of the gelatin mold. After the original model has been removed, place the gelatin back in the mold and paint the surface with alum water (saturated solution). In preparing the solution the alum should be triturated until it is extremely fine and then dissolved in water. If it be not finely powdered, particles will remain undissolved which will lodge in the numerous depressions in the gelatin and a rough duplicate will be the result. Give the gelatin four or five applications of the alum water, drying with a cold-air blast, to harden the surface of the gelatin. (I have used formalin for this purpose, but I think alum water gives a better result.) Set aside to thoroughly dry, then paint with shellac varnish, two coats. I use varnish made as follows: One ounce gum shellac (clean by picking out foreign particles and washing if necessary); dissolve in three ounces of alcohol. After the shellac varnish is thoroughly dry, give a light coat of sandarac varnish (gum sandarac one ounce, alcohol four ounces). This will give a glossy surface and the duplicate will come out very smooth.

Flowing a duplicate. In flowing the duplicate, begin at one side of the case, and with a stiff-bristled brush work the plaster around in the usual way, being careful to exclude all air as the plaster is worked into the numerous depressions. Fill to the top of the gelatin mold and set aside to allow the plaster to thoroughly harden. Then remove the duplicate in the same manner in which the original was removed—taking care to remove it slowly and easily so as not to injure the gelatin or unnecessarily break up the coating of varnish.

If several casts are to be made, give the gelatin mold a painting of the shellac varnish and a light one of sandarac before each pouring. Of course the same gelatin can be used for other cases, and it is a good idea when through with one case to cut the gelatin up in small pieces, for it will melt up much quicker when needed again.—HOWARD D. KEELER, *Dental Brief.*

OBITUARY.

MR. HENRY M. LEWIS.

DIED, Friday, January 26, 1906, at his residence, Germantown, Pa., of pericarditis, HENRY MARTYN LEWIS, in the seventy-fifth year of his age.

Only a week before his death Mr. Lewis was actively at work at his desk attending to his duties as president of The S. S. White Dental Manufacturing Co. On the evening of January 18th, while conversing with members of his family, he suddenly became alarmingly ill. Physicians hastily summoned pronounced his ailment pericarditis, and after administering restoratives, under which he reacted promptly and favorably, expressed the opinion that a short period of rest would restore the patient to his normal condition. Up to the time of this seizure Mr. Lewis had been exceptionally vigorous for his years, although for some two years past he had been subject to slight heart trouble, leading him to take short seasons of rest, with excellent results owing to the splendid recuperative powers of his constitution. On the resumption of his duties the trouble would return, but it had never been regarded as especially serious until the fatal attack supervened. Even then, so prompt was the response to the remedies administered that expectation of speedy recovery was based on the supposed activity of his vital powers. For several days improvement continued steadily. Only a few minutes before the end came he was cheerful and expressed himself as feeling better after an excellent night's rest; then, with scarcely an instant's warning the stroke fell, the cord of life was snapped, and one of earth's strong men had gone to his Maker.

Henry Martyn Lewis was descended on both sides from Puritan stock, his forebears in America dating back to within a few years of the landing of the Pilgrims at Plymouth Rock. Of his paternal ancestors the first in America, William Lewis, settled at Cambridge, Mass., in 1632, but shortly removed to Hartford, Conn., where he is said to have built the first house for residence purposes. Of his maternal ancestral line the first on this side was Alice Southworth, who became the wife of William Bradford, so long the governor of the Plymouth Rock Colony. The father of Henry M. Lewis was William Goodwin Lewis; his mother was Eliza Lucy Southworth, and he was born in New Britain, Conn., October 24, 1831.

When he was seven years old his father removed to Philadelphia, where he attended the public schools, entering the High School in the fourteenth class. He did not, however, complete the course, but left school in 1847 to go into the wholesale commission hardware house of his father. Eventually he was taken into partnership, the firm continuing as W. G. Lewis & Son until after the outbreak of the Civil War. The greater part of their business was in the Southern States, the secession of which so crippled the house as to finally force it to the wall. In 1862 Mr. Lewis entered the government service in the Internal Revenue department, remaining there until 1867, when he became cashier and confidential clerk to Dr. Samuel S. White. His fidelity to his duties, his sound, conservative judgment on questions of business policy, and his strong, virile character so commended themselves to Dr. White that by his will Mr. Lewis was made one of the trustees of his estate, and as such was one of the organizers of The S. S. White Dental Manufacturing Co., which succeeded to the business of Dr. White July 1, 1881.

He was the first general manager of the Company, having special charge of the financial and commercial departments, including the supervision of the work of the branch houses and in general the relations of the Company with other business houses.

Ten years later, on the death of Dr. James W. White, the first president of the Company, Mr. Lewis became its president, continuing in that relation until his death.

He was thus for nearly a quarter of a century one of the controlling figures in the Company's policy, for the last fourteen years its head and active director. That his policies were safe and sound the continual growth of the Company and the wide extension of its business are positive evidence. At its establishment it carried something over four hundred employees on its pay-roll; before his death the roll had grown to exceed sixteen hundred and fifty. In 1881 there were five branch houses, besides the parent house in Philadelphia; in 1906 this number had been increased to twelve, including four in foreign lands.

His relations with dealers and the other patrons of the house were characterized by kindness and leniency, and as a mark of respect and appreciation of his character the dental trade throughout the country closed their places of business during the time of the funeral.

Mr. Lewis was married February 26, 1856, to Miss Frances Amelia Smith, born in Alabama, of Connecticut ancestry, but who had become a resident of Doylestown, Pa. Mrs. Lewis died August 8, 1900, after a lingering illness, during which the devotion and care of her husband never flagged. Four children, two sons and two daughters, survive: Frederick H. Lewis, of Staunton, Va., and H. Bertram Lewis, of Philadelphia; Mrs. Albert Mortimer Barnes, and Mrs. Edward C. Cutler, both of Philadelphia.

Mr. Lewis early became a member of the Presbyterian Church, in which his sterling characteristics made him a prominent worker. He was connected twenty-five years with the Walnut-street Presbyterian Church, serving the greater part of the time as ruling elder and for several years as clerk of the session. In 1889 he removed to Germantown and entered into the communion of the First Presbyterian Church of Germantown, of which also he became an elder.

The funeral services were held at the residence, 5520 Wayne avenue, Germantown, on Monday, January 29, 1906, and were conducted by the Rev. Charles R. Erdman, of the First Presbyterian Church of Germantown, assisted by the Rev. Dr. Stephen W. Dana, of the Walnut-street Presbyterian Church, who reviewed in a feeling manner the long and useful term of service of Mr. Lewis with his congregation.

The remains were taken to Doylestown for interment beside those of his wife.

Mr. Lewis belonged to that class of typical American workers whose business and pleasure derive their nourishment and support from the desire to accomplish results. He planned, labored, and executed with a steady determination to have his efforts crowned with success. His work was his pleasure and his pleasure his work. After completing his daily tasks at the office, he studiously and determinedly cast aside business and entered with equal zeal into the enjoyments of his family circle and his work in the church.

Avoiding excesses in living and securing the requisite amount of sleep, he was rewarded with most remarkably good health and clearness of intellect. He had not been confined to bed on account of sickness from the days of his youth, and until the summer of 1904 was not obliged to seek rest.

Honest, conscientious, conservative in all his business dealings, and considerate of the interests of others, he merited the reputation which has been so generously credited to him as being a friend to all with whom he came in contact.

SOCIETY NOTES AND ANNOUNCEMENTS.

AMERICAN DENTAL SOCIETY OF EUROPE.

THE next meeting of the American Dental Society of Europe will be held at Berlin, Germany, August 2, 3, and 4, 1906. A most cordial invitation is extended to members of the profession to be present.

An interesting program is already assured, and it is hoped to make this one of the most interesting and largely attended meetings in the history of the society.

GEO. O. WEBSTER, *Hon. Sec'y,*
Pariser Platz I, Berlin, Germany.

NATIONAL DENTAL ASSOCIATION.

COMMITTEE ON DENTAL HISTORY.

AT the Buffalo meeting of the National Dental Association, the Committee on History of Dentistry reported to the association that Dr. Vincenzo Guerini of Naples, Italy, had written a History of Dentistry from the earliest times down to the beginning of the nineteenth century, which work is in the hands of the committee, having been translated into English and fully revised and edited. Dr. Guerini has generously placed the publication of this great work under the patronage of the National Dental Association in token of his appreciation of American dental development. In order that the work may be published without financial loss it is necessary that about 700 subscriptions for copies at $5.00 each be obtained before contracts for printing, binding, and publishing the work can be entered into, and the duty of securing these advance subscriptions has been assigned to the Committee on History of Dentistry of the National Dental Association.

The committee believes that the general and growing interest in the history of our profession is a sufficient warrant for this undertaking. Our historical records are scattered through a vast literature and much of it is of great antiquity. These data have never before been gathered together and arranged in a consequential logical order. Dr. Guerini has spent many years of his professional life and large amounts of money in collecting the material for this work. It has involved the searching of libraries and museums, the translation of many old documents and publications, and the digesting and arranging of this matter into proper form. As an historical writer the distinguished author needs no introduction, as his contributions on dental history in our magazines are well known, and their excellence is an earnest of the excellent and exhaustive character of his larger work now in the hands of the Committee on History of Dentistry for publication.

The importance and value of dental art and science as a humane service is well recognized, but we are so accustomed to view this question from the modern standpoint that we, generally speaking, overlook the immense work done by our predecessors, reaching far back in unbroken line to the mists of antiquity. It was they who laid the foundations upon which modern dentistry has been built, and no man can peruse the record of their efforts as set forth in Dr. Guerini's book without developing a higher appreciation of their work and a keener realization of the worth and dignity of the calling which they in common with ourselves followed.

It is the desire of the committee having this matter in charge to secure as promptly as possible the subscriptions necessary before the work can be published. We ask you to consider this as a personal appeal to forward your subscription for the work to Dr. Charles S. Butler, The Frontenac, Buffalo, N. Y., who, with the treasurer of the National Dental Association, Dr. V. E. Turner, Raleigh, N. C., will act as custodian of the publication fund.

Announcement will be from time to time made in the dental journals of the growth of the subscription list and the progress of the work of publication. The sooner the required

700 names are obtained, the sooner the work can be issued. The volume, it is estimated, will comprise about 500 pages. It will be profusely illustrated, and bound in cloth.

In case this proposed publication meets with the success which it merits, a second and companion volume, treating of the more modern aspect of dentistry, will probably be issued under the same auspices and conditions.

EDWARD C. KIRK, Philadelphia.
WM. H. TRUEMAN, Philadelphia.
GORDON WHITE, Nashville, Tenn.
H. L. AMBLER, Cleveland, Ohio.
JAS. MCMANUS, Hartford, Conn.
J. Y. CRAWFORD, Nashville, Tenn.
A. H. FULLER, St. Louis, Mo.
S. A. FREEMAN, Buffalo, N. Y.
W. E. BOARDMAN, Boston, Mass.
CHARLES S. BUTLER, Buffalo, N. Y.
BURTON LEE THORPE, *Sec'y*, St. Louis, Mo.
CHAS. MCMANUS, *Chairman*, Hartford, Conn.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE twenty-fourth annual meeting of the National Association of Dental Examiners will be held at the New Kimball House, Atlanta, Ga., September 14th to 17th, commencing 10 A.M., Friday, September 14, 1906.

The rates per day will be, European plan, from $1.50 to $4.00, American plan, from $3.00 to $6.00, governed by choice of rooms.

The convention hall is in the hotel, and every effort will be made by the proprietors for the care and comfort of the members.

Arrangements are being perfected for those desiring a short ocean trip at reduced rates, via the Clyde and Old Dominion steamship lines, notice of which will be given by circular later.

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

LAKE ERIE DENTAL ASSOCIATION.

THE annual meeting of the Lake Erie Dental Association will be held at the Hotel Rider, Cambridge Springs, Pa., May 15, 16, and 17, 1906.

The committees are working hard to make this an extra-fine meeting.

All ethical dentists are cordially invited to attend.

V. H. MCALPIN, *Sec'y*, Warren, Pa.

SEVENTH DISTRICT (N. Y.) DENTAL SOCIETY.

THE thirty-eighth annual meeting of the Seventh District (N. Y.) Dental Society will be held in the Chamber of Commerce, Rochester, N. Y. March 27 and 28, 1906.

NORTH NEBRASKA DENTAL ASSOCIATION.

THE second semi-annual meeting of the North Nebraska Dental Association will be held at Norfolk, Neb., April 5, 1906.

C. S. PARKER, *Sec'y*,
Norfolk, Neb.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE forty-second annual convention of the Connecticut State Dental Association will be held in Bridgeport, Conn., Tuesday and Wednesday, April 17 and 18, 1906.

F. HINDSLEY, *Sec'y*,
Bridgeport, Conn.

NEW HAMPSHIRE DENTAL SOCIETY.

THE twenty-ninth annual session of the New Hampshire Dental Society will be held at the Pemigewassett House, Plymouth, N. H. (Gateway to the White Mountains), May 8 and 9, 1906.

F. F. FISHER, *Sec'y*,
Elm st., Manchester, N. H.

ALABAMA DENTAL ASSOCIATION.

THE next annual meeting of the Alabama Dental Association will be held in the Commercial Club rooms, Mobile, Ala., May 8 to 11, 1906.

A full attendance on the part of the members is urged, and a cordial invitation is extended to all ethical non-association dentists in the state, and to our professional brethren from other states. The usual reduced railroad rates on the certificate plan will be secured.

L. A. CRUMLEY, *Sec'y*,
401 Jefferson Co. Bank bldg.,
Birmingham, Ala.

NEW YORK STATE DENTAL SOCIETY.

The thirty-eighth annual meeting of the New York State Dental Society will be held at Albany, N. Y., Friday and Saturday, May 11 and 12, 1906. Saturday afternoon will be devoted exclusively to clinics.

Any ethical member of the profession having anything of interest to present, or desiring to clinic, will kindly communicate with the Clinic Committee, as follows:

F. Messerschmitt, *Chairman*,
1023 Granite bldg., Rochester, N. Y.
W. D. Tracy,
46 W. 51st st., New York city.
G. B. Mitchell,
448 Porter avenue, Buffalo, N. Y.
G. A. Sullivan,
18 Dove st., Albany, N. Y.
F. W. Proseus,
238 Monroe ave., Rochester, N. Y.

VERMONT STATE DENTAL SOCIETY.

The thirtieth annual meeting of the Vermont State Dental Society will be held at Brattleboro, Vt., May 16, 17, and 18, 1906.

It is expected that we will have the largest attendance of any meeting ever held by this society. All the leading manufacturers have signified their intention of making an exhibit of their products, and this adds greatly to the success of a convention.

Every progressive dentist should be present. Special social features for Thursday evening.

Thomas Mound, *Sec'y*,
Rutland, Vt.

BALTIMORE COLLEGE OF DENTAL SURGERY ALUMNI ASSOCIATION.

The Alumni Association of the Baltimore College of Dental Surgery will hold its reunion at the college building, Baltimore, Md., May 10 and 11, 1906.

The Committee has endeavored to reach by letter every graduate it has been able to locate. Those who have not received preliminary notice of this reunion are requested to send their addresses to the secretary, so that they may receive an official program.

An interesting program is being arranged, consisting of clinics and papers by men of exceptional ability, also reunion of classes and alumni dinner. All ethical members of the profession are cordially invited to attend.

W. W. Dunbracco, *Sec'y*,
327 N. Charles st., Baltimore, Md.

CALIFORNIA STATE DENTAL ASSOCIATION

AND THE

Alumni Association of California University, Dental Department.

The California State Dental Association and the Alumni Association of the Dental Department of the University of California will hold a joint session and clinic at San Francisco, Cal., May 14 to 18 inclusive, 1906.

C. E. Post, *Recording Sec'y*,
San Francisco, Cal.

ST. LOUIS DENTAL COLLEGE ALUMNI ASSOCIATION.

The Alumni Association of St. Louis Dental College (formerly Marion Sims Dental College) will hold their annual clinic at the college building, Grand ave. and Caroline st., Monday and Tuesday, May 7 and 8, 1906.

Address all communications to Dr. Geo. B. Winter, Frisco building.

O. Hammer, *President*,
R. O. Butts, *Sec'y*.

FLORIDA STATE DENTAL SOCIETY.

The twenty-third annual meeting of the Florida State Dental Society will be held at the Continental Hotel, Atlantic Beach (near Jacksonville), Wednesday, June 13, 1906, continuing in session three days.

All ethical practitioners are most cordially invited to be present. An interesting program has been arranged. A number of special clinics will be provided.

Carroll H. Frink, *Cor. Sec'y*,
Fernandina, Fla.

MINNESOTA STATE DENTAL ASSOCIATION.

The twenty-third annual meeting of the Minnesota State Dental Association will be held in Minneapolis, Minn., at the Dental Department of the State University, on June 11, 12, and 13, 1906.

J. F. McCrea, *President*.
F. E. Cobb, *Sec'y*,
Minneapolis.

IOWA STATE DENTAL SOCIETY.

The forty-fourth annual meeting of the Iowa State Dental Society will be held at Des Moines, Iowa, May 1, 2, and 3, 1906.

C. W. Bruner, *Sec'y,* Waterloo, Iowa.

MISSOURI STATE DENTAL ASSOCIATION.

The forty-first annual meeting of the Missouri State Dental Association will be held at Springfield, Mo., June 5, 6, and 7, 1906.

An unusually interesting program is being arranged. A number of men eminent in the profession have signified their intention of being present and the meeting promises to be the best in the history of the association.

All ethical dentists are cordially invited to be present.

Sam T. Bassett, *Cor. Sec'y.*
St. Louis, Mo.

TEXAS STATE DENTAL ASSOCIATION.

The twenty-sixth annual meeting of the Texas State Dental Association will be held in the city of Galveston, Texas, June 14, 15, and 16, 1906.

The indications are that this meeting will be the best ever held in Texas. All ethical practitioners are extended a cordial invitation to meet with us.

Bush Jones, *Sec'y,* Dallas, Texas.

NORTH DAKOTA DENTAL ASSOCIATION.

The North Dakota Dental Association was organized at a meeting held at Fargo, N. D., January 16 and 17, 1906, under the auspices of the Fargo District Dental Society. The following officers were elected: G. A. Rawlings, president; H. L. Starling, vice-president; O. H. Sossaman, secretary; S. Rowan, treasurer.

Drs. Weeks and Wells of Minneapolis participated in the launching of the new organization, which was most favorable, and gave good promise for the future success of the association.

O. H. Sossaman, *Sec'y,* Lisbon, N. D.

KENTUCKY STATE DENTAL ASSOCIATION.

The next annual meeting of the Kentucky State Dental Association will convene at Dawson Springs, Ky., June 4, 5, and 6, 1906. We anticipate a most pleasant as well as a profitable meeting, and a cordial invitation is extended to the profession.

W. M. Randall, *Sec'y,*
Louisville, Ky.

INDIANA STATE DENTAL ASSOCIATION.

The forty-eighth annual meeting of the Indiana State Dental Association will be held at the West Baden and French Lick Springs, Indiana, June 26, 27, and 28, 1906.

The social side of this meeting will be a feature, while the papers and clinics have promise of being the best ever given at this society.

Ethical practitioners are invited to resort, recuperate, and re-illume with us.

R. A. Adams, *Sec'y,*
Clinton, Ind.

INSTITUTE OF DENTAL PEDAGOGICS.

At the thirteenth annual meeting of the Institute of Dental Pedagogics, held in New York, December 28, 29, and 30, 1905, the following officers were elected for the year 1906: D. R. Stubblefield, Nashville, Tenn., president; J. H. Kennerly, St. Louis, Mo., vice-president; W. Earl Willmott, secretary and treasurer. Executive Board—Ellison Hillyer, L. P. Bethel, and J. Q. Byram. Master of Exhibits—H. E. Friesell. Master of New Teaching Facilities—C. E. Jones.

W. Earl Willmott, *Sec'y,*
93 College st., Toronto, Can.

KANSAS BOARD OF DENTAL EXAMINERS.

The Kansas State Board of Dental Examiners will hold a meeting in Topeka, Kans., May 7, 8, and 9, 1906, for the purpose of examining candidates who desire to practice dentistry in this state.

Applicants will be examined in regular college branches, and will also be required to demonstrate their ability in the following practical work: Gold, amalgam and cement filling, vulcanite plate, and kind of crown that is necessary for the clinic assigned. An opportunity will be given each to demonstrate his or her knowledge of working porcelain. Materials and furnace for this will be furnished, but for all other operations the materials, small instruments, and an engine must be furnished by the candidate. All clinics will be furnished by the board. Those intending to take the examination should have their fee of $10.00 and names in the hands of the secretary by April 15th, in order that ample accommodations for each can be arranged. For further information address

M. I. Hults, *Sec'y*,
Hutchinson, Kans.

MASSACHUSETTS BOARD OF REGISTRATION.

A meeting of the Massachusetts Board of Registration in Dentistry, for the examination of candidates, will be held in Boston, Mass., March 7, 8, and 9, 1906.

All applications, together with the fee of twenty dollars—if first examination—must be filed with the secretary of the board on or before February 28th, as no application for this meeting will be received after that date.

Hereafter candidates for second and subsequent examinations will be required to fill out an application blank and forward it to the secretary as above.

Every candidate for examination must be twenty-one years of age.

Application blanks may be obtained from the secretary.

Temporary licenses are never granted.

The fee for third and subsequent examinations is $5.00.

G. E. Mitchell, *Sec'y*,
25 Merrimack st., Haverhill, Mass.

MINNESOTA BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Minnesota State Board of Dental Examiners will be held in Minneapolis, at the Dental Department of the State University, on April 3, 4, and 5, 1906.

All applications must be in by noon, Tuesday, April 3d. Application blanks will be furnished upon request by

Geo. S. Todd, *Sec'y*,
Lake City, Minn.

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UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JANUARY 1906.

January 2.

No. 808,690, to Otto C. Schulz. Dental silk box.

No. 808,935, to Theodore G. Lewis. Handle for dental flasks.

January 9.

No. 809,365, to Adam W. Feltmann. Dental tool.

January 16.

No. 810,184, to William Broadbent. Carved gum form.

January 23.

No. 810,611, to Wesley F. Blasingame. Dental obtunder.

No. 810,712, to John M. Card. Artificial denture.

No. 810,713, to John M. Card. Artificial denture.

No. 810,769, to Edwin C. Jones. Inhaler.

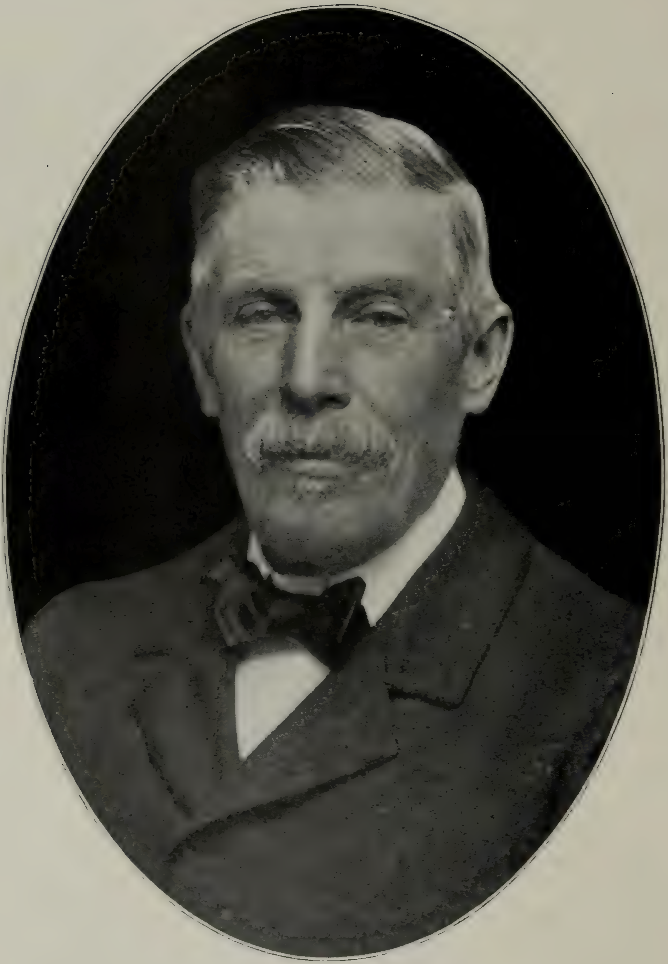
No. 810,842, to John M. Card. Artificial denture.

January 30.

No. 811,370, to William Brush. Dental can.

No. 811,442, to Clarence F. Rodgers. Dental and surgical lamp.

No. 811,479 to Nathan L. Burke. Dental compress.



DR. CHARLES S. BECK.

THE

DENTAL COSMOS.

VOL. XLVIII. APRIL 1906. No. 4.

ORIGINAL COMMUNICATIONS.

THE QUESTION OF EXTRACTION IN ORTHODONTIA.

By CALVIN S. CASE, D.D.S., M.D., Chicago, Ill.

(I.)

AT the February 1905 meeting of the Second District Dental Society of the State of New York, certain prominent orthodontists of America were invited to present contributions relative to the advisability of extracting teeth as an aid or necessity in the correction of irregularities.

It is not the purpose of this article to attempt a lengthy discussion of the papers in general, which, with the beautiful illustrations, formed in the main a most worthy and commendable series of contributions to the science of orthodontia; and, barring some statements which had no foundation as matters of scientific fact, and other propositions which claimed to be proved by the illustrations but which would fall far short of it in the light of an equally fair showing of the other side, I am pleased to say that I heartily agree with most of the sentiments expressed, so far as they went, and am especially pleased that the advocates of non-extraction presented so forcible an argument.

I hope that the truths of these papers will sink deep into the hearts and practices of that horde of dentists who—though perhaps with honest purpose but with dense ignorance of the subject—are indulging in the indiscriminate, thoughtless, and disgraceful malpractice of extracting deciduous and permanent teeth for the correction or prevention of complex irregularities—reprehensible in all cases, however crowded or jumbled the arch, where the dento-facial relations of the teeth do not positively indicate a decided protrusion.

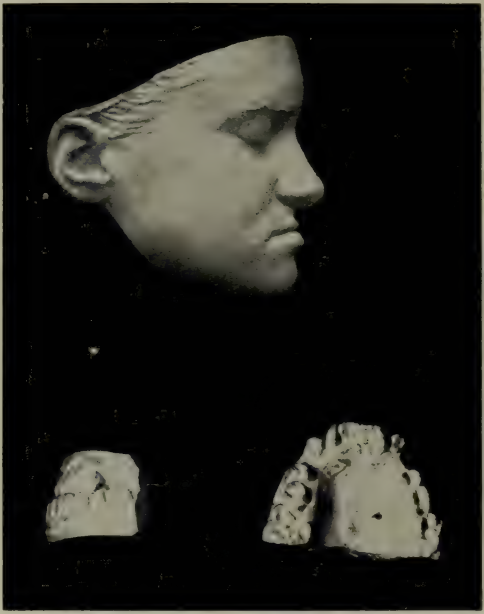
In this connection it would be well to remember that the true position of the teeth in relation to dento-facial harmony can never be determined by dental relations, or the relations which the upper and lower teeth bear to each other, as one would be inclined to infer by the almost total absence in the said papers of any reference to this important principle in orthopedic dentistry.

Another peculiarity of the contributions from the non-extractionists was that the principal, and in most cases the only evident object, was to show the possibilities of producing a normal occlusion for symmetrical, dental, and functional purposes alone. However, in that large majority of the cases where the facial outlines were neither shown nor mentioned, and also in those which were shown to be improved, it is to be presumed, and I have no desire to deny the fact, that they were exactly the cases that should be corrected without extraction.

A very large proportion of the contributions from the non-extractionists consisted in showing the baleful results from injudicious extraction of teeth. These mistakes are plentifully made by Tom, Dick, and Harry, and by some of the best of us. I could have shown hundreds of casts of such cases which have fallen to my lot to treat, had I been invited and had I chosen to do so. Besides the thousands of disasters that have been produced in occlusal relations by the needless and in some instances criminal extractions of permanent teeth, there are numberless dento-facial imperfections and deformities which have arisen solely from this same cause. I have at times been quite surprised at the poor judgment shown by dentists even of advanced standing in extracting deciduous and permanent teeth, and when one considers the hundreds of dentists of less ability let loose upon trusting communities, it is not strange that there arise so many examples of criminal malpractice along this line, especially in the extraction of perfect permanent teeth from crowded arches in which all of the teeth are necessary to perfect occlusion and dento-facial relations. Many seem to be wholly ignorant of the quality, possibilities of movement, and functions of the alveolar process, which is susceptible of any required degree of expansion to accommodate the teeth, however crowded and mal-aligned.

Fig. 1 is made from the casts of a case sent to me from Ohio for correction. In the letter of introduction from the dentist who referred the case he says, "I have extracted the first bicuspids knowing that you would find it necessary." The casts speak for themselves. It would seem that any child would know better than to extract teeth from an arch so plainly seen to be retruded.

FIG. 1.



Nor is extraction for correction of irregularities confined to the bicuspids. Next in order of frequency of extraction are the canines, lateral incisors, and the first permanent molars. In one case presented at my clinic the central incisors had been extracted for this purpose.

But what does all this prove? Simply that the accidental or unavoidable loss of certain teeth, and the injudicious extraction of some teeth—mostly by incompetents—had resulted in certain cases, in disaster to normal occlusion and regularity. Absolutely nothing more. The collection and portrayal of disasters in railroad travel and in the use of anesthetics would be quite as legitimate to prove that humanity should desist from the employment of those benefits, as that such evidence should be presented in order to prove that extraction is never demanded in the correction of dento-facial irregularities.

In this connection I wish to say that there are doubtless many cases, for example, of decided upper protrusions which have been properly and perfectly corrected by extracting the first bicuspids, but which not being retained a sufficient length of time, the reactive forces—possibly of inheritance—moved the teeth more or less back toward their former malpositions. In many of these cases the patients are to blame for failing to report at once the first apparent tendency toward the reactive movement. I presume this applies to a number of my cases, and I would not be surprised if this scouring of the country by the non-extractionists in their frantic and futile endeavors to prove their fantastic theory, would result in some of these cases being brought to light and exhibited for this purpose. I have for some time been carrying a big stick for just this sort of contingency and nothing would please me better than to have an opportunity to use it. What could it prove? Nothing further than that the teeth after correction were not retained a sufficient length of time. If the reactive forces, opposed by the retruding action of the labial muscles, were sufficient to carry front teeth forward again, would not that tendency be greatly increased with all of the upper teeth crowded back the width of a bicuspid, or even to only one-half this degree?

It has been frequently asserted or implied that a normal occlusion is the only occlusion which will tend to retain the teeth in corrected position when—as in those cases for which the first bicuspids have been advisedly extracted and the teeth properly corrected—the importance and the utility of placing the buccal cusps in an interdigitating occlusion equally obtains. So that that particular phase of the operation cannot be used as an argument for greater retention in non-extraction. In fact, I shall endeavor to show that an extensive disto-mesial shifting of the teeth with the intermaxillary force, now widely practiced by the non-extractionists for obtaining normal dental relations, is in many instances far more liable to result in non-retention than the preservation of an abnormal—though interdigitating—occlusion of the buccal teeth which had been produced and fixed by natural forces, to say nothing at present of other equally important phases. Therefore it will not surprise me to find in a few years that the majority of the present most enthusiastic advocates of the intermaxillary force are its bitterest enemies, simply because they are overdoing a good thing.

Out of the entire forty-five cases that were exhibited by the non-extractionists at the said meeting, there were only seventeen cases presented showing beneficial results of correction without extraction. Of these, eleven cases consisted of that irregularity which is characterized by a labial mal-eruption of the upper canines. I have noticed for some time in the various published papers and articles which were written ostensibly for the purpose of proving the benefits of regulating without extraction that the principal, and in some instances, almost the only irregularity presented as evidence was that which is characterized by the mal-eruption of the upper canines.

This particular feature of the display may serve as one of the very best modes of disciplining a large proportion of dentists who essay the regulation of teeth, because there has been no character of irregularity in which the errors of injudicious extraction of the bicuspids and other teeth, as an aid to correction, has been so frequent, so grave, and so uncalled for. But to the mind of an experienced expert, the possibilities and demands for correcting these cases without extraction give no evidence in favor of the universal practice of non-extraction, because it happens to be a fact, and one that should be well known, that in about nine out of every ten cases of this particular character of irregularity, extraction of the bicuspids is absolutely culpable. Why? Because in about this proportion of these cases the teeth, which otherwise would have been in normal dento-facial relations and occlusion, have assumed that unnatural malposition from local causes. Usually the premature loss or injudicious extraction of deciduous teeth have permitted natural forces to push the buccal teeth forward and the incisors back, to the partial or complete closure of the permanent canine spaces, and often with a concomitant contraction and mal-alignment of the lower arch.

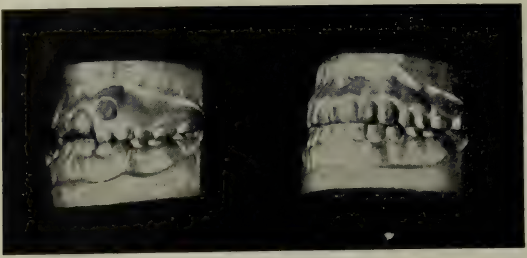
I could have shown from my private practice a far greater number of these cases than were exhibited at the meeting, some of which would have indicated to a novice even greater need of extraction from a dental point of view, but all of which were perfectly corrected without extraction. In fact, had extraction been resorted to in most of the cases, irreparable wrong would have been done to the patient.

Fig. 2 is a fair sample of many cases. It will be seen upon the left side that the space for the canine was completely closed, and notwithstanding the very crowded condition of the dental arch it was evident at the start, from the undeveloped facial area, that the adult physiognomy would require all of the teeth in the arches for the development of perfect dento-facial outlines and beauty.

This is well shown in Fig. 3, which was made from a photograph of this patient taken after treatment. One who would be foolish enough to mar the beauty of such a face by extracting teeth to aid in the operation for correction would not deserve the title of orthodontist.

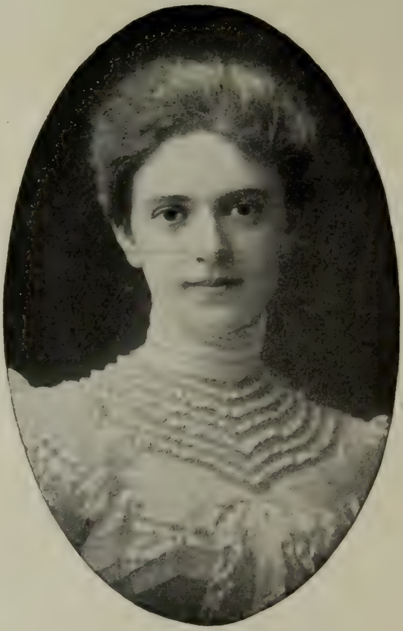
Does this prove, however, as has been claimed in various places by this kind of showing, that extraction should never be resorted to in any case of mal-eruption of the canines? It does not. It simply proves nothing toward establishing a universal law of non-extraction, nor do the occlusal relations or their mal-alignments indicate in the slightest degree whether teeth should be extracted or not, because I can show another lot of dental casts representing cases in practice in which the relations of the teeth are exactly the same as the above, except that

Fig. 2.



the mesial mal-relation of the upper buccal teeth to the lower are more pronounced, and for which had I *not* extracted the upper first or second bicuspids, the inevitable result would have been a facial deformity. Why? Be-

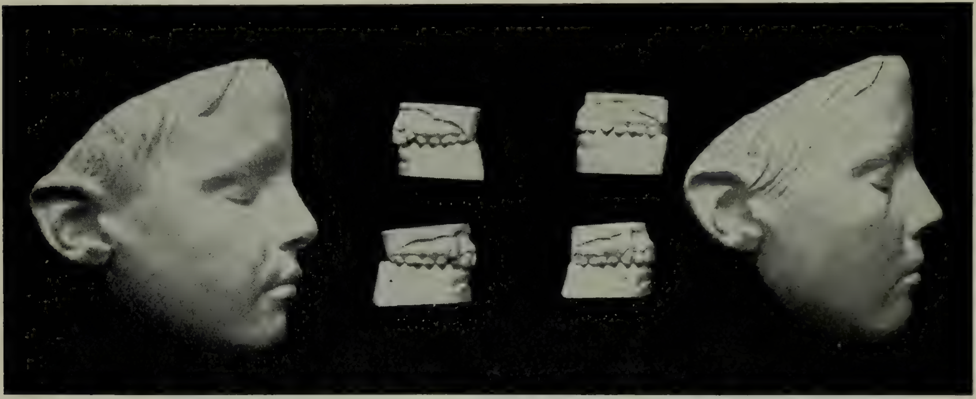
Fig. 3.



cause the natural or inherited dento-facial relations of the upper buccal teeth which were in mesial mal-interdigitation with the lowers, plainly indicated that they were fully the width of a bicuspid in front of the position they should occupy in order that the labial teeth when in alignment might be in dento-facial harmony.

Fig. 4 will serve to illustrate the character of these physiognomies. The protrusion of the upper lip immediately over the mal-aligned canines is usually quite marked, and would have extended in this case to the entire upper lip, with the production of an upper protrusion, had the teeth erupted in alignment.

FIG. 4.



Many of the non-extractionists will say, Why not push the upper buccal teeth back one-half the width of a cusp, and the lower forward the same distance, and thus avoid extraction and establish normal occlusion? In a not far distant future this foolish question will not be asked so frequently or so loudly as it is today.

Many of these cases would have resulted in the common upper protrusions, like other inherited cases of this character, had it not been for the possible premature loss of the deciduous teeth, which permitted the labial muscles to press the incisors back to close the canine spaces. The buccal teeth also may have been forced slightly forward to a complete mal-interdigitation. Be that as it may, without extraction an upper protrusion would have been inevitable. In Fig. 4, as is common with this type, the lower teeth at the beginning were in perfect dento-facial relations. That is, the lower lip supported by the lower labial teeth and alveolar process was in perfect esthetic position in relation to the chin, while the lower jaw and chin were strong and in perfect esthetic relation to the principal features of the physiognomy. In these cases, as in many others of the same character, the upper buccal teeth in natural occlusion are occasionally fully the width of a cusp in front of a normal occlusion, as can be seen. Now let us suppose that these cases had been corrected without extracting the first bicuspids. Can anyone who possesses the slightest conception of the fitness of things say that in the correction of occlusion in this way the dento-facial outlines do not demand that the movement should be confined to the upper teeth alone, and should consist mainly in a distal movement of the buccal teeth fully the width of a bicuspid? And further, had such an extensive distal movement of the buccal teeth been possible—which is very doubtful after the eruption of the second molars—would it have been possible, in the process of tipping the crowns of all of those eight teeth backward the width of a bicuspid, with the inevitable dipping of their occlusal planes, to have produced in this way the same perfect interdigitating, masticating occlusion, which nature had already produced through the forces of inheritance, development, and use?

Fig. 5.

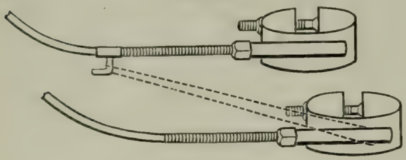
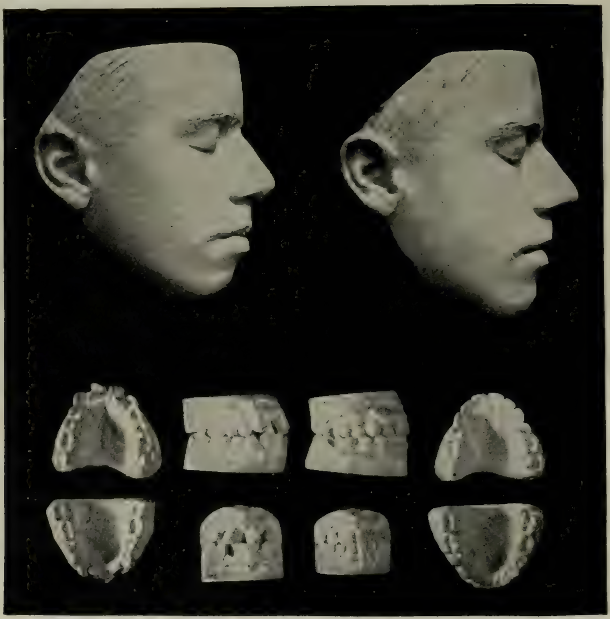


Fig. 6.



And would it have been possible to retain that position with the natural reactive forces and the final eruption of the third molars driving them forward? If such an unnatural position of the teeth in the jaws were maintained by hook or crook, would not such a plan have been very liable to impact the third molars?

Methinks I can hear the non-extractionists all cry out as with one voice, "Oh no! We would not think of doing it that way at all!" Nor would they. What they would really do under these circumstances in their present state of mind—believing as they do in the universal law and applicability of normal occlusion in every case—would be to apply the intermaxillary force through the medium of an apparatus similar to that shown in Fig. 5. With this they would doubtless produce a normal disto-mesial relation of the cusps of the upper and lower buccal teeth, and then when the upper canines and incisors were placed in arch alignment on the basis that all the other teeth were corrected, they perhaps would take plaster impressions of the case and construct beautiful casts, the pictures of which they would represent on screens and in journals, thus demonstrating the wonderful results and possibilities of correcting these cases without extracting; and their audiences and readers, viewing only the pictures of the teeth, would perhaps be convinced that it was the only scientific way to regulate teeth.

Now let us see what they really would have accomplished from the standpoint of that higher plane of orthopedic dentistry, which some day is sure to hold sway in this department. The crowns of all the lower teeth would have been moved forward with the production of an unesthetic protrusion of the lower lip, and the upper buccal teeth would have been moved back, to a position which permitted only a partial dento-facial correction of the upper labial teeth. Furthermore, if they had employed the apparatus shown in Fig. 5 (and I want to say that this is the only apparatus with its reverse action which has as yet been published by the "new school" for the application of the intermaxillary force), the protruding movement of the lower teeth would have been about twice as great as the retruding movement of the upper, as I have repeatedly pointed out, and which I am glad to say has also been fully confirmed by Dr. Ottolengui, the present president of the American Society of Orthodontists. The facial result of this method of operating in these cases, therefore, would have left the patient with a decided protrusion over the entire dento-facial area. Which, thirdly and finally, impales the theory of non-extraction, in cases of this type, upon either horn of the dilemma.

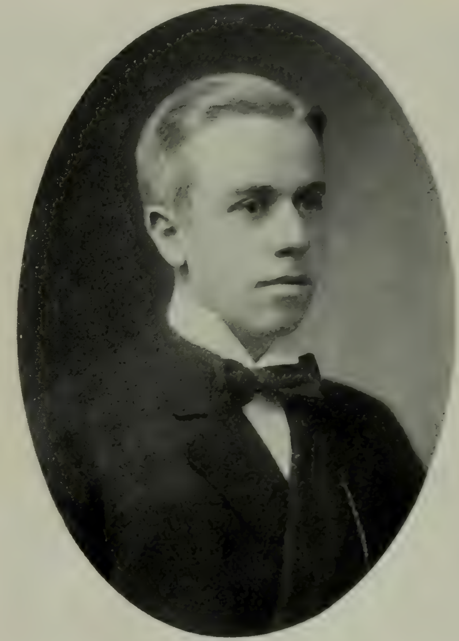
This argument applies not only to all of this particular type of irregularity (which is type C of class 1 in my classification), but it applies to all decided protrusions of the upper teeth with lower normal.

I should not be very much surprised if some young men of three or four years' experience in orthodontia would reply to this in their usual platitudinous style, by telling me that if I understood the laws and advantages of normal occlusion, and how to employ the intermaxillary force according to the teachings of the "new school," I would then be able to correct these cases perfectly without extraction.

Occasionally in a bimaxillary mal-alignment of the canines, with the buccal teeth in normal occlusion, the facial outlines plainly indicate that a decided bimaxillary protrusion would result in any attempt to correct the irregularity without extraction. This was pointed out in a recent article, which was illustrated by Fig. 6.

As shown by the finished profile cast, and by Fig. 7, which is from a photograph of the patient taken at about this time, the protrusion was not wholly reduced even after the extraction of all the first bicuspids, and with every possible effort made to reduce it by the employment of occipital and intermaxillary auxiliaries.

FIG. 7.

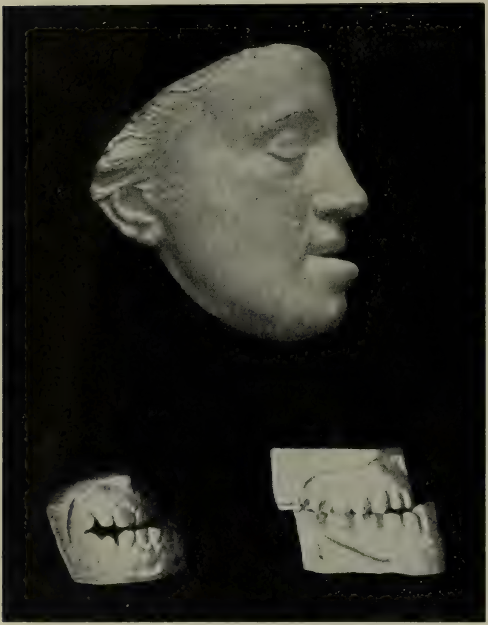


Of the remaining six cases of the symposium which were exhibited to prove that teeth should never be extracted in the practice of orthodontia, two cases were youths with buccal occlusion normal, but with crowded mal-alignment of the labial teeth, due to premature loss of deciduous teeth; a character of irregularity for which extraction is never indicated, except in those rare cases where bimaxillary protrusion is strongly in evidence.

There was one case of a decided retrusion of the upper teeth with a slight protrusion of the lower, for which condition no one but a novice would think of extracting for correction.

There are, however, extreme cases of this class in which the protrusion of the lower teeth in relation to the chin and main features of the physiognomy is far more pronounced than the upper retrusion that demands the extraction of lower teeth. This is well shown in Fig. 8, which represents a case now under treatment for a patient twenty-seven years of age, with all the teeth erupted and the lower arch crowded and overlapping. I should like to ask if the advocates of non-extraction would undertake the futile attempt to retrude all of those sixteen lower teeth the distance demanded for a correction of the lower facial outlines?

FIG. 8.



Finally, to complete the number, there were only three cases shown corrected which exhibited a decided mesial malrelation of the upper buccal teeth to the lower, and with the relations of the front teeth in that malposition which is commonly, though often quite erroneously, characterized as "upper protrusions."

These three cases were the only ones presented by the non-extractionists, so far as I have a right to judge, about which there should ever have arisen a question of extraction.

You may well ask: Can it be true that out of forty-five cases presented by the non-extractionists at a symposium which was especially organized to foist their claims, there were only three cases presented by them about which there could ever arise in the minds of competent orthodontists a question of extraction? The published record speaks for itself.

Now let us somewhat extensively consider this particular character of malocclusion in its various dento-facial relations, and its correction without and with extraction of bicuspids.

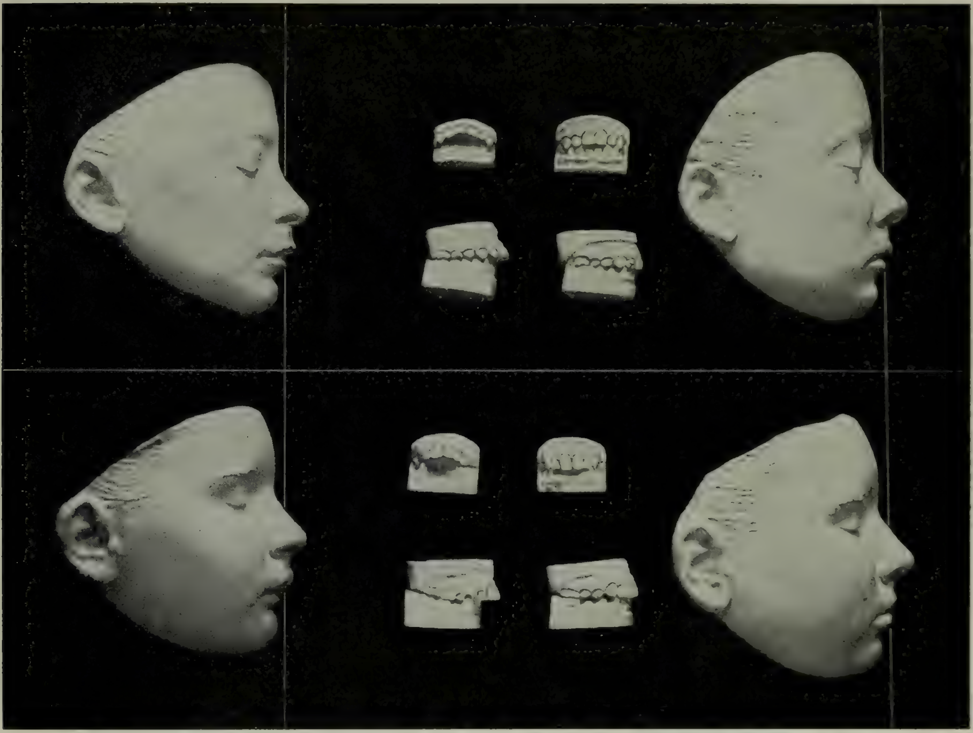
I am going to assume that these three cases were perfectly corrected without extraction, and that the best possible dento-facial results were obtained. It goes without saying also, that the correction was accomplished principally through the reciprocal disto-mesial action of the intermaxillary force, which moved all of the lower teeth forward and the upper teeth backward, until the occlusion of the buccal teeth was normal. We must all, therefore, admit at the start that these cases, dento-facially considered, were originally protrusions of the upper in connection with retrusions of the lower, else such a movement of the teeth would produce abnormal or unesthetic facial outlines. I hardly think it would be asserted that any one of these cases was purely a protrusion of the upper, which would mean that the lower teeth being in proper relation to facial outlines should not be moved forward, else there would be an abnormal protrusion of the entire lower lip, with a partial, or complete obliteration of the esthetic labio-mental curve beneath the lip so necessary to perfect facial contour, and with the possible production of that least to be desired of all expressions, a receding chin. It would also mean that proper dento-facial and occlusal correction was accomplished by moving all of the upper teeth back fully the width of a bicuspid in those cases that were in full mal-interdigitation, else the upper protrusion of the facial outlines would not be fully corrected. The objection and doubtful possibilities of this extent of movement, especially after the eruption of the second molars, have been mentioned under another head.

On the other hand, does it not also go without saying, that these cases were corrected with the Angle appliances? And if there are no other of his appliances for employing the intermaxillary force that are radically different from that shown in Fig. 5, would it not be well to admit that all of these cases were more of a retrusion of the lower than protrusion of the upper? Because with an uncontrolled reciprocal action of the intermaxillary elastics which that apparatus portends, the lower teeth would be moved forward considerably more than the upper teeth would be moved backward, and if such a movement is not demanded for the perfection of facial outlines, it would be wrong, except in the eyes of those who can see no wrong when normal occlusion can somehow be attained.

Now let me assert, upon the authority of over twelve years of extensive employment of the intermaxillary force for the correction of malocclusion and dento-facial deformities, that exactly that character of movement—*i.e.* a decided protruding movement of all the lower teeth and a slight retruding movement of the upper—is frequently demanded in cases in which the upper teeth in relation to the lower are fully the width of a cusp in front of a normal occlusion.

There are also an equal number of cases in which an equally reciprocal disto-

Fig. 9.



mesial movement is demanded. In fact there is demanded for the correction and perfection of dento-facial outlines, with this particular malocclusion, every gradation of movement which lies between retrusions of the lower teeth with upper normal, and protrusions of the upper teeth with lower normal, a very large portion of which can be, and for many years have been corrected without extraction, principally by an intelligent application of the intermaxillary force, not only by myself, but I presume by other orthodontists who commenced the employment of this force soon after its publication in 1893.

Dr. A. E. Matteson of Chicago commenced the extensive employment of the intermaxillary force in 1894 for the disto-mesial correction of malocclusion of the buccal teeth, and thereby hangs a tale, which I think would surprise some of the young and enthusiastic members of the so-called "new school," who pride themselves upon the belief and frequent assertion that this foundation principle of their school originated with its birth in 1900.

Had I been invited to present a contribution to the said symposium, it would have been possible for me to have presented many cases, in which the upper teeth in relation to the lower were in the same disto-mesial malocclusion as the three cases which were exhibited, and for which real dento-facial correction without extraction was perfectly accomplished.

Figs. 9, 10, and 11 are presented to show a few of these cases of one single type, *i.e.* that which is characterized facially by a decided retrusion of the lower

Fig. 10.

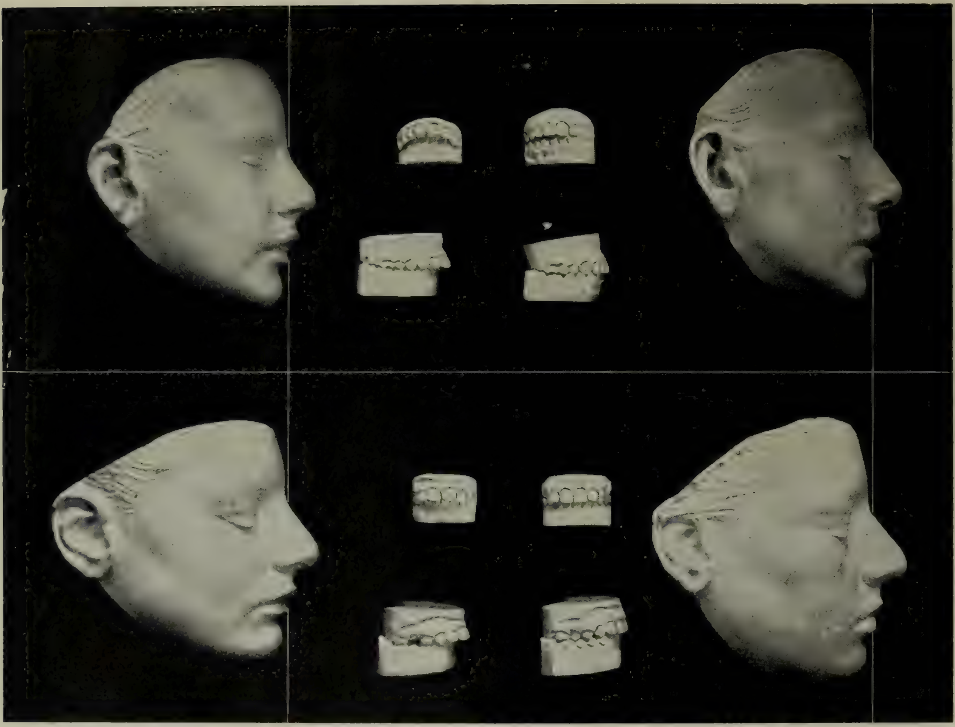


FIG. 11.

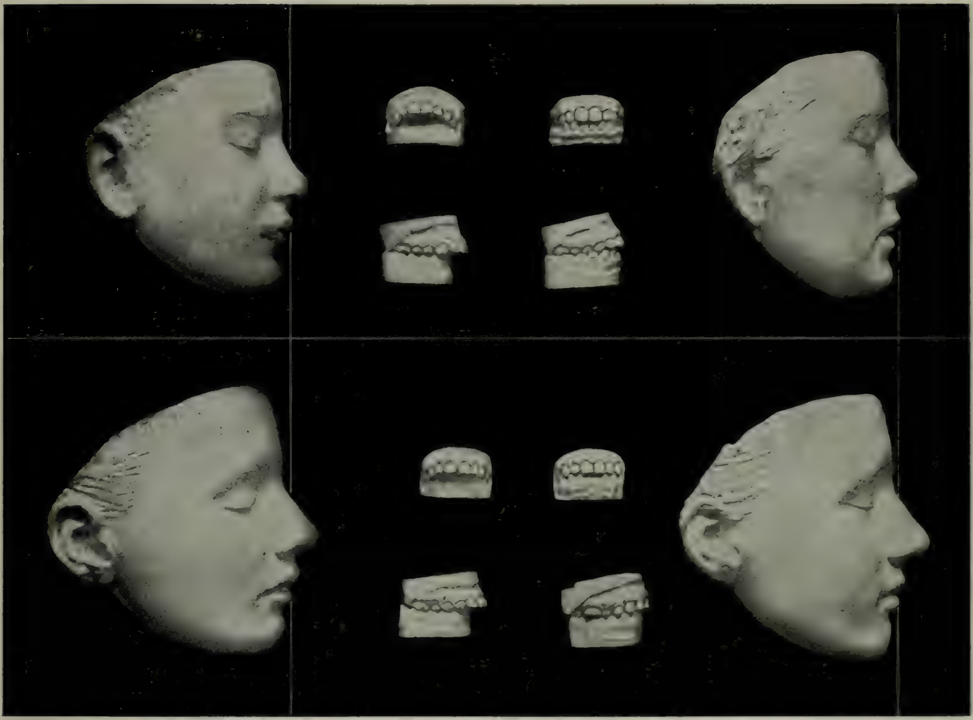
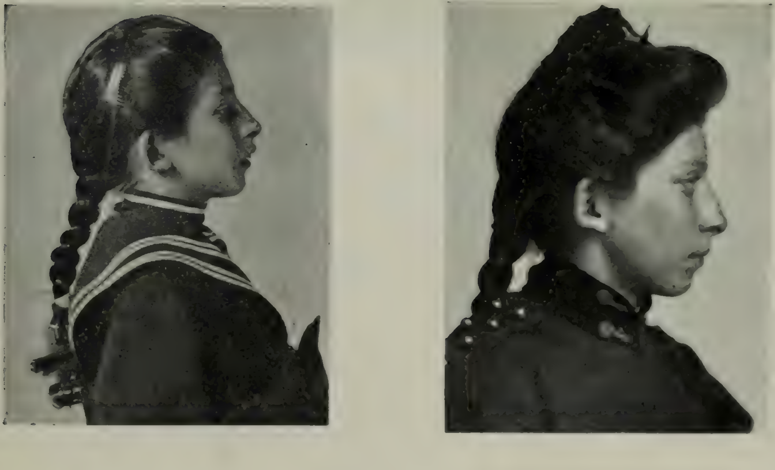


FIG. 12.



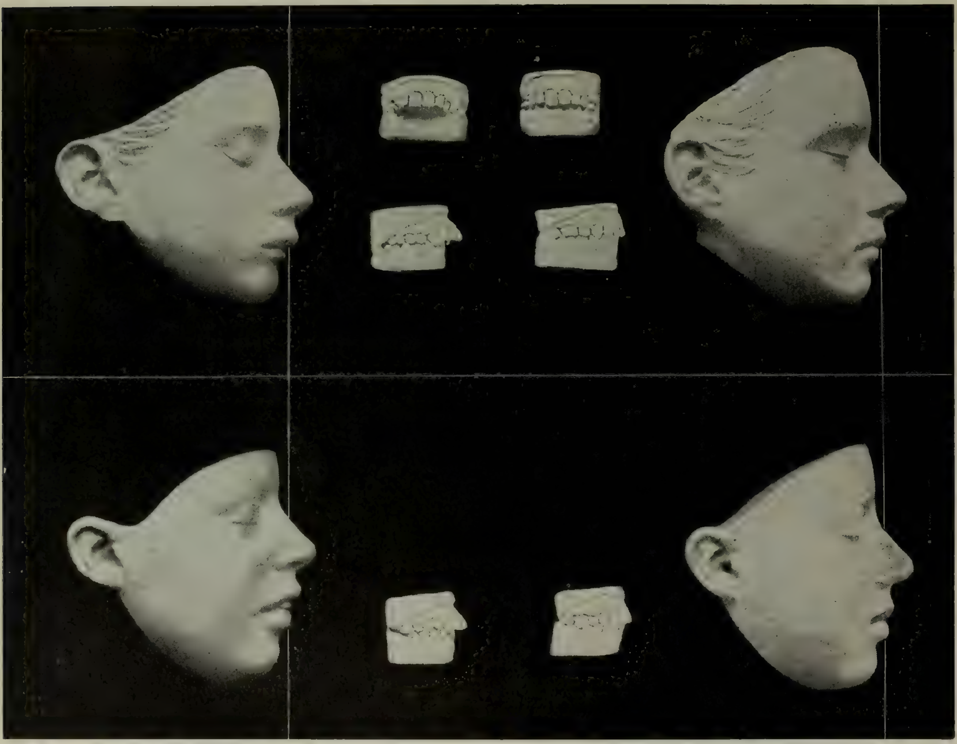
teeth with slight protrusion of the upper. Note the original decided antero-posterior mal-relation of the upper and lower teeth in masticating occlusion.

The patient represented by the last one of the group, with many others of a different character, was personally examined by Dr. R. Ottolengui, who was kind enough to spend a few hours in my office recently, and who, I think, will vouch for the correctness of the illustrations. (Compare the facial results of any one of these six cases with Fig 12, which is one of the said three cases exhibited at the symposium.)

Would I not have an equal right to assert upon this evidence that extraction is never indicated? Then why is it that it does not prove the hypothesis? Because there is another class of cases having exactly the same antero-posterior mal-relation of the upper and lower teeth, which are decided upper protrusions with the lower normal, and which declare that the entire movement calculated to properly correct the facial outlines can only be accomplished by a considerable retruding movement of the upper labial teeth and alveolar process, a movement which usually can be easily accomplished after extracting the first bicuspids, and, what is of the greatest importance, the positions of the lower teeth and the original mal-interdigitation of the buccal cusps are not disturbed.

This, in the writer's estimation, after the eruption of the second molars especially, is a principle of far more value for future use and assurance of retention, than the accomplishment of an artifi-

Fig. 13.



cially posed ideal occlusion, obtained at the expense of moving all the upper and lower buccal teeth to unnatural positions, to say nothing of the probability of placing them in abnormal dento-facial relations.

Figs. 13 and 14 will serve to illustrate comparatively few of the many of this class of cases which have fallen to my practice. In every instance the first or second bicuspids were extracted, and the teeth brought to a good masticating and retaining occlusion with an endeavor to preserve, or restore with the least necessary movement, the original interdigitation of the cusps which nature had produced or striven for.

In a large proportion of these cases, the teeth are normally inclined, with the roots and alveolar process in which they are placed in an equally protruded relation, and with the production of a heavy unesthetic bulginess over the entire upper dento-facial area, showing that a retruding movement of the roots of the labial teeth, as well as that of the crowns is often demanded to correct the facial outlines.

I have explained why these cases should not be corrected by an attempt to tip the crowns of all of the fourteen upper teeth back to the extent of their abnormal protrusion, and also why the practice is radically bad which teaches the reciprocal shifting of the crowns to normal occlusion. This sort of teaching may deceive a good many for a time, but fortunately, truth and the higher ideals and possibilities of the art will prevent it from deceiving everyone all the time. Their present loud acclaim of the so-called new-found wonders of orthodontia.

Fig. 14.

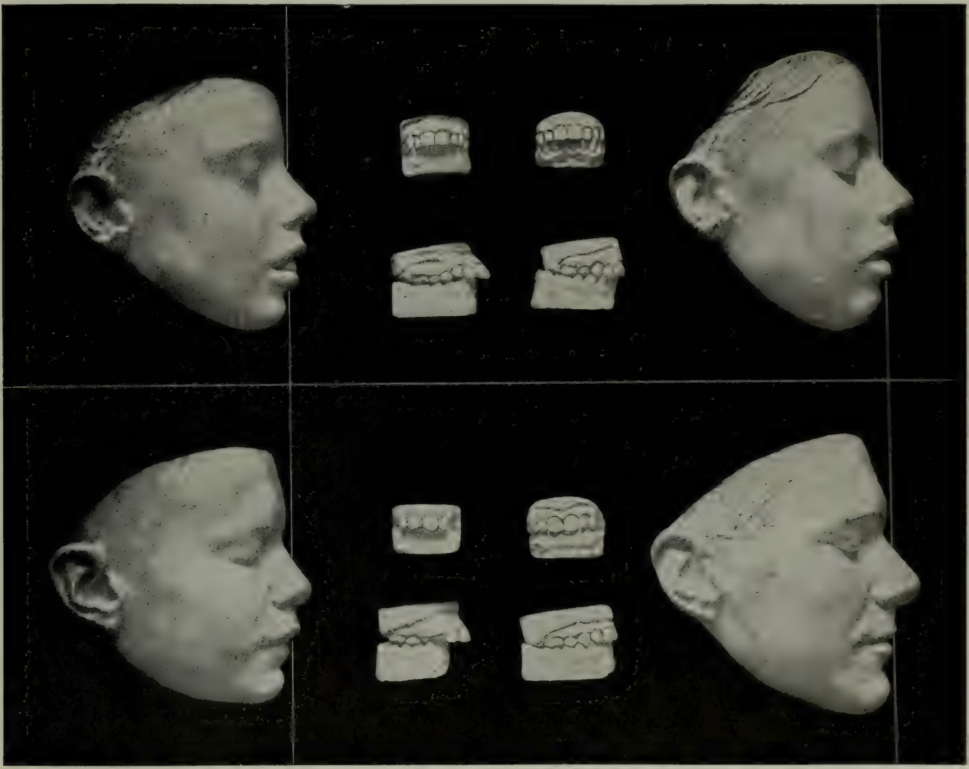


Fig. 15.

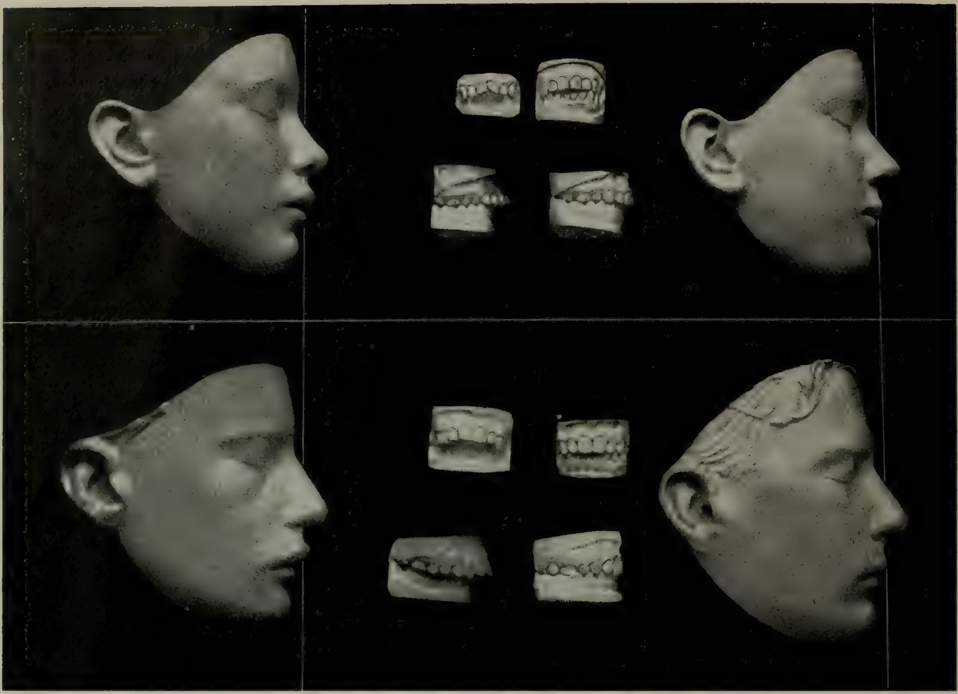
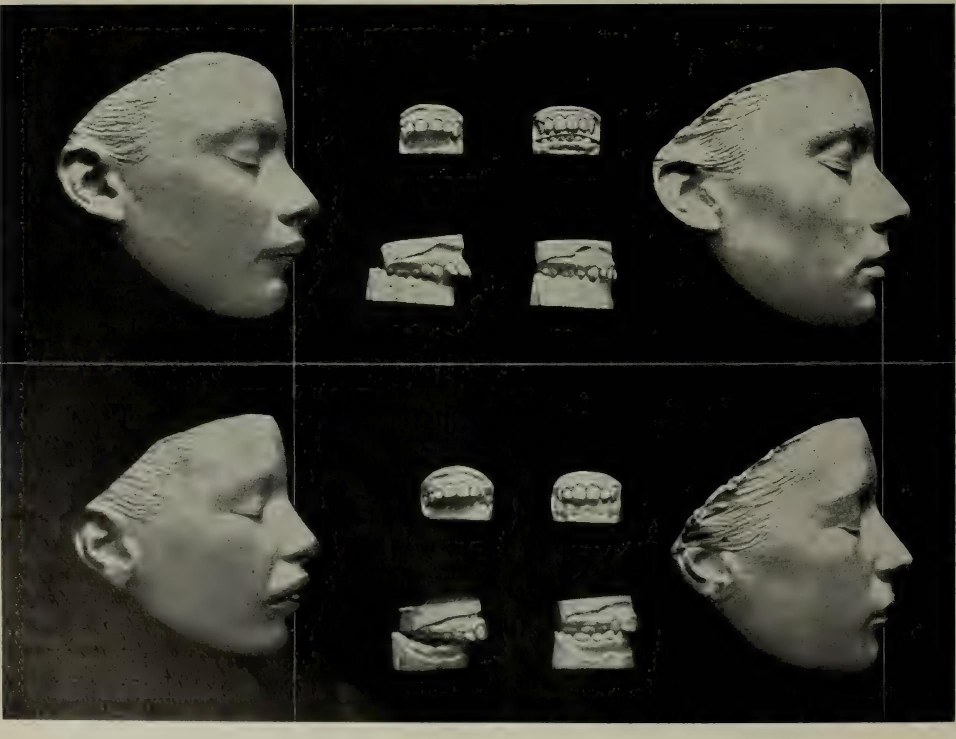


Fig. 16.



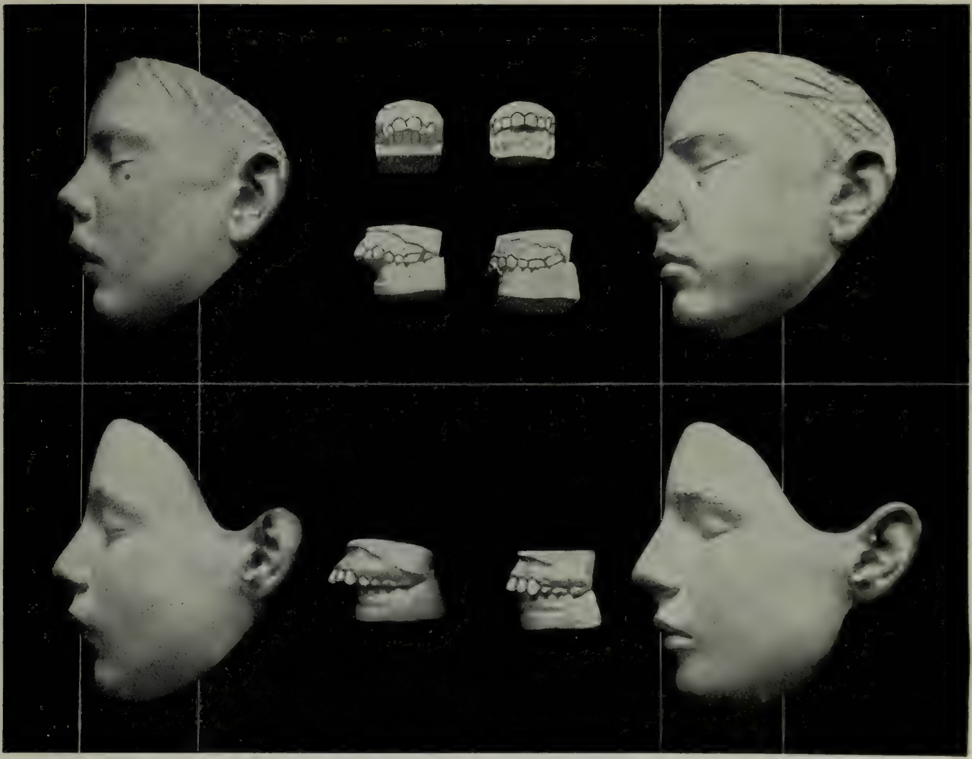
upon such a limited experience and showing, reminds one of the enthusiasm of the boy who supposed he had seen the whole circus, when in reality his dad had only shown him the procession.

As before stated, between the two above extremes—*i.e.* retrusion of lower and protrusion of the upper—will be found every gradation of dento-facial inharmony that may be produced with this special malocclusion.

Figs. 15 and 16 show a few examples of a distinct and very common dento-facial type, having exactly the same disto-mesial malocclusion of the teeth as in the two former classes, and which may be considered an intermediate gradation or composite of those extremes. In these cases the protrusion of the upper, being accompanied with a retrusion of the lower, frequently appears far more pronounced than it really is. The correction of the facial outlines demands about an equally reciprocal antero-posterior movement of the upper and lower dento-facial areas.

If treatment be commenced before the eruption of the second molars, or soon thereafter, many cases may be corrected without extraction by an antero-posterior movement of the upper and lower teeth, through a proper application of the intermaxillary force.

Fig. 17.

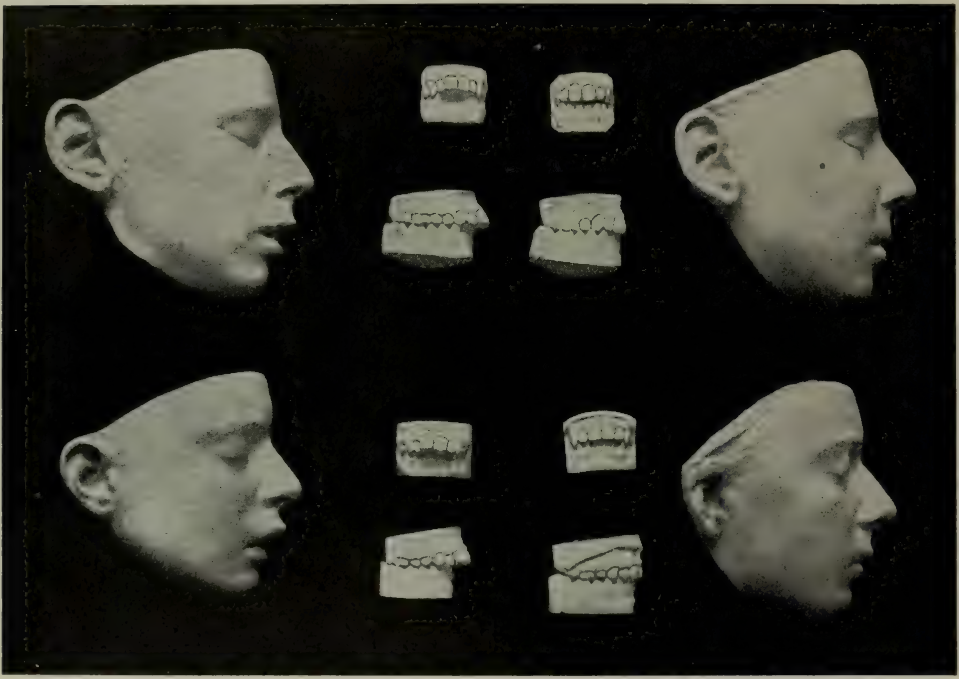


In a very large proportion of these cases in my practice, however, which present for treatment, and especially those in which the upper protrusion is more pronounced than the lower retrusion, and the buccal cusps are in full mal-interdigitation, the second or first upper bicuspids are extracted: then all the lower teeth and upper molars are moved equally forward, preserving their original occlusion; and the upper labial teeth are moved backward to close the bicuspid spaces, thus safely correcting the facial outlines with an avoidance of the difficulties and dangers of an extensive distal movement of all the upper buccal teeth, and with a greater assurance of permanence of retention.

There is still another distinct type of dento-facial inharmony shown in Figs. 17 and 18 in which this same character of malocclusion obtains. It differs from the second group, or upper protrusions, in that the lower jaw and chin are deficient or retruded as compared to more perfect facial outlines. I wish particularly to call attention to this type, which is quite common, because it will be seen that when the lower teeth and lower lip are not retruded in relation to the chin, a protruding movement of the lower teeth to aid in correcting the occlusion will be very liable to give a receding chin effect. Therefore this type demands even more strongly than the second group the extraction of the upper first bicuspids with the view of retruding the labial teeth the full distance allowed by the space.

In some instances the full interdigitating correction of the occlusion may demand a further retrusion of all the upper teeth. It is needless to say that the principal force is the occipital; the dental stationary anchorages attached to all the upper buccal teeth are employed only to take up the slack of the retruding bow and thus retain the movement as it is gained.

FIG. 18.



If the intermaxillary force is employed, the lower teeth should be thoroughly anchored to prevent a forward movement, unless this also is demanded.

It will be seen that I have here presented the results of treatment in fourteen cases of decided disto-mesial malocclusion, in all of which the upper buccal teeth in relation to the lower were fully the width of a cusp in front of a normal occlusion.

I have purposely selected six typical

cases which demanded correction without extraction, and twelve which demanded the extraction of the first or second bicuspids for their perfect correction, as it is about in that proportion, in this character of occlusion, that the two methods of treatment—non-extraction and extraction—are respectively demanded.

In all of these cases the final occlusal relations were so perfect that one would never stop to think whether it were a normal occlusion or not, unless intent upon the discovery. In fact, in those cases in which the first bicuspids are extracted and the front teeth are properly moved back to close the spaces with the least possible movement of all the other teeth, the occlusion for mastication with interdigitation of cusps is frequently quite as perfect as it could be if typically normal; and what is of quite as much importance, the teeth in these cases are far more liable to retain their positions than where all of the teeth have been shifted disto-mesially to a normal occlusion. But the main thing, after all, is that the facial outlines and not the relations of the dentures to each other should always determine the movements demanded and the character of perfect occlusion it is best to establish.

(To be continued.)

A BRIEF REVIEW OF THE PROMINENT PIONEER MANIPULATORS OF GOLD FOIL.

By **BURTON LEE THORPE, M.D., D.D.S., St. Louis, Missouri.**

(Paper, illustrated with lantern slides, read before Section I of the National Dental Association, Buffalo, N. Y., July 25, 1905.)

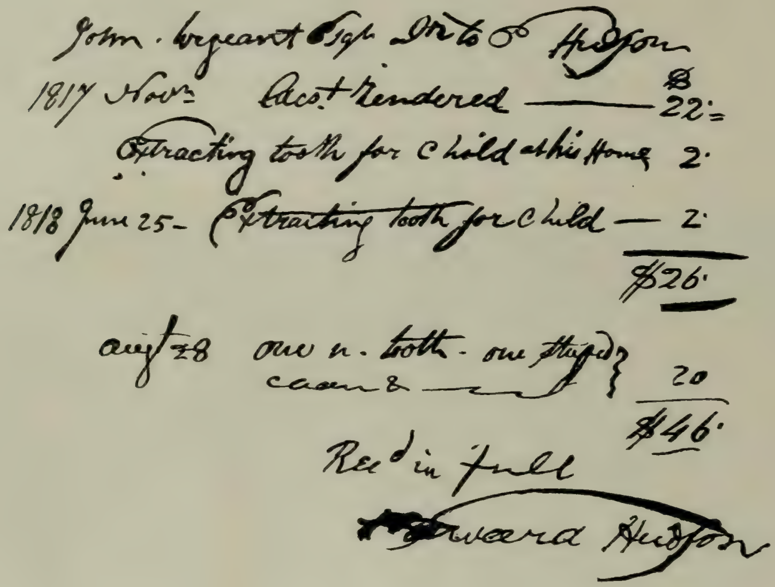
MUCH of interest might be said of the expert operators of the past. This paper and these photographs are presented to keep afresh in our memory the great good these men have done for the profession, and that we may meet them "face to face."

Carlyle has aptly said that "The history of the world is the biography of great men," and so the history of dentistry is the biography of great men in our profession, who by their genius and versatility have placed our calling where it is today. The time allotted is too short for us to have more than a passing glance at the work of each of these men. Many who were equally skilful have intentionally been omitted.

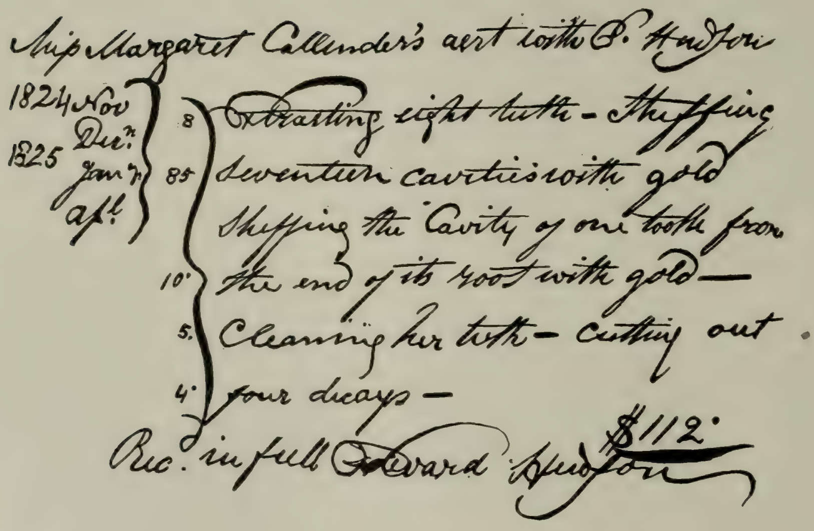
Edward Hudson of Philadelphia was a remarkably picturesque character of artistic and musical temperament, and one of the most skilful gold operators of early times. He was born in Ireland, October 1772, and studied dentistry with

EDWARD HUDSON.
Philadelphia, Pa.

an uncle, who educated him at Trinity College, Dublin, where he had as classmates Robert Emmet the patriot, Thomas Moore the poet, and Arthur O'Connor. Here Hudson gained a reputation as debater and writer and was active in Irish politics. He was drawn into the "Emmet conspiracy," and was soon afterward arrested and placed in Kilmainham jail, where he was confined until 1802. During his imprisonment he was allowed to practice his profession for the nobility and gentry of the country, who paid him excellent fees for his skill. After four



John · Sergeant Esqr Dr to E Hudson
1817 Novr Accot Rendered —— $22=
Extracting tooth for Child at his Home 2·
1818 June 25– Extracting tooth for Child — 2·
$26·
Augt 28 one n. tooth - one stuffed cavity & —— } 20
$46·
Recd in full
Edward Hudson



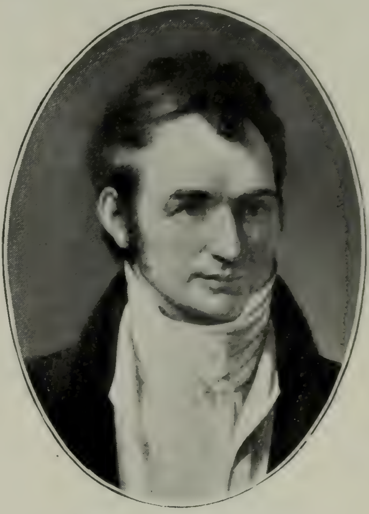
Miss Margaret Callender's acct with E. Hudson
1824 Nov 8 Extracting eight teeth - Stuffing
Decr
1825 Jany 85 seventeen cavities with gold
Apl Stuffing the Cavity of one tooth from
10· the end of its root with gold—
5· Cleaning her teeth – cutting out
4· four decays –
$112·
Recd in full Edward Hudson

years of confinement he was released, and immediately embarked for America, arriving in Philadelphia about 1803, where he soon became one of the recognized leaders of the profession. At this time nothing but non-cohesive gold was used.

Hudson is probably one of the first to have filled root-canals with gold foil. I here show a facsimile of a bill rendered by him in 1817, in which he makes a charge of twenty dollars "for one stuffed canal." The next picture shown is a facsimile of a bill rendered by him in 1824, in which he makes a charge for "filling the cavity of one tooth from the end of its root with gold." It is known that his work was far above the average of his time, and he is reported as being one of the most highly skilled operators of his day. He was of poetic nature and was an excellent performer on the flute. Thomas Moore pays eloquent tribute to his musical attainments in the preface to his poetical works, where he says: "A young friend of our family, Edward Hudson, a nephew of the dentist of that name, who played with much taste and feeling the flute, and who, unluckily for himself, was but too deeply warmed with the patriotic ardor then kindled around him, was the first who made known to me this rich mine of our country's melodies—a mine from the working of which my humble labors as a poet have since derived their sole luster and value."

During his confinement in prison, Hudson drew upon the wall of his cell a charcoal portrait designed to illustrate a crisis in the story of St. Cecilia. Thomas Moore says that when he saw this drawing it suggested to him the theme of his poem, "The Origin of the Harp."

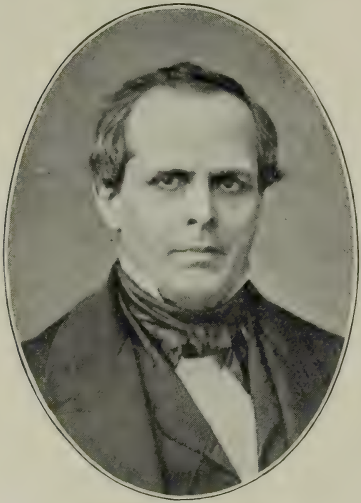
Horace H. Hayden of Baltimore has the credit of being the "strong man" and the "power behind the throne" in organizing dentistry from a trade into a truly scientific profession. It was Hayden who furnished the gray matter. An entire evening could be spent in reviewing his achievements and the great work he did for dentistry, for which he may truly be entitled to be denominated the father of American dental science. He was born to be a leader, and was raised during the stirring times of the revolution. As a boy he was a naturalist; soon to become proficient in the study of the ancient languages. Next a cabin-boy on two voyages to the West Indies. At the age of sixteen he learned the trade of his father, who was a carpenter and an architect. Later on he became a school teacher, and at the age of twenty-four was a patient of Mr. John Greenwood, a skilful dentist of New York city, who afterward acquired fame as the dentist to General Washington. Through Greenwood's encouragement young Hayden studied dentistry, and after traveling for a while as itinerant dentist he located at Baltimore, where he soon obtained proficiency as an operator, excelling especially in the manipulation of soft gold foil. He gained the confidence of the medical profession; recognizing his ability, they indorsed him for the honorary degree of doctor of medicine, which was conferred on him both by the Jefferson College of Medicine of Philadelphia, and the University of



HORACE H. HAYDEN,
Baltimore, Md.

Maryland in 1837. In 1825 he delivered a course of lectures on dental surgery to the medical class of the University of Maryland, being the first to deliver such a course in the United States. He was the leader in organizing the *American Journal of Dental Science,* the Baltimore College of Dental Surgery, and the American Society of Dental Surgeons. As a writer on medical, dental, physiological, and pathological subjects he was very prominent. Early geological science was also indebted to him for a four-hundred-page contribution, entitled "Geological Essays," which he published in 1821. He was also a talented botanist, and wrote on kindred subjects. Hayden was a real Moses, who led the profession to the promised land of education, ethics, and scientific attainments. We may safely call him the father of American dental surgery.

Chapin Aaron Harris of Baltimore. None can question that Harris and Hayden were the saviors of American dentistry. They divorced it from empiricism and married it to science, by organizing the first dental college, the first dental journal, and the first dental society in the history of our profession.



CHAPIN A. HARRIS,
Baltimore, Md.

Harris was a talented man of much energy, and a firm believer that "The empiric makes of all things a secret, but the artist gives publicity to his useful inventions." Harris was a skilful manipulator of non-cohesive foil; some present in this room are living witnesses to the fact. They have seen his operations and possibly some have seen him operate. His contributions to our literature, such as "Dental Art: a Practical Treatise of Dental Surgery," first issued in 1839, now revised and known as "Harris' Principles and Practice of Dentistry." His long connection—as the leading spirit—with the Baltimore College of Dental Surgery, and his services as editor of the *American Journal of Dental Science* during a period of twenty years, will make his name ever remembered as long as the pages of dental history are read. His sacrifice of time, money, and health for the advancement of his profession, and his untiring efforts in behalf of the journal, college, and society, made him a martyr to the profession he so greatly honored.

Elisha Townsend of Philadelphia, a contemporary of Harris, was the son of Quaker parents, a watchmaker by trade, and also an actor. He studied dentistry at the age of twenty-eight, and became a most skilful operator, his manipulations having all been of a high order of mechanical excellence. He filled root-canals with gold exclusively, in a most perfect manner. He was accustomed to place his gold for immediate use, on a china plate in the oven of the kitchen range over night, claiming that it worked better. He was considered by his contemporaries a very able dentist. Some of his fillings, inserted fifty years ago, are today as perfect as the day they were inserted. He was instrumental in bringing about the change from the large-handled, clumsy instruments to smaller ones better adapted for delicate work. He also advocated the use of the watchmaker's eyeglass, contending that it aided in securing exactness and materially preserved the operator's sight.

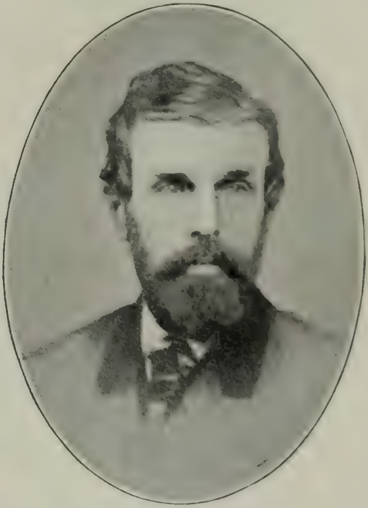
He was an "all-gold" advocate, and for a time was interested in amalgam, which was then in the market under the trade name of "Townsend's amalgam." After experimenting with this filling material he went back to gold.

Joshua Tucker of Boston was a talented member of the profession, an expert teacher of penmanship, a school teacher in his early career, and one of the most expert manipulators of non-cohesive gold. He also manufactured porcelain teeth as early as 1833. It is hard to realize in this day the difficult operations that could be performed in those days with non-cohesive gold foil, used in cylinders and pear-shaped pellets.

ELISHA TOWNSEND,
Philadelphia, Pa.

John Skinner Clark was an early pioneer of St. Louis, but afterward removed to New Orleans, where he was prominent as a practitioner, as editor of the *Dental Obturator,* and lastly as organizer and first dean of the New Orleans Dental College. Dr. Clark wrought wonders with non-cohesive gold foil. He cut the gold into strips, folded the strip with small tweezers, reduced the length of the folded strip by manipulation, shaped it into a cylindrical form, and by holding it in the palm of his left hand, rolled it back and forth until it became thoroughly condensed like a gold wire the

JOSHUA TUCKER,
Boston, Mass.



JOHN S. CLARK,
New Orleans, La.

size of a knitting needle. These cylinders were cut into smaller ones of different lengths with strong scissors, and were placed in the cavity and condensed laterally. Other cylinders were introduced in the center to fill the place from which the wedge-like instruments had been removed. It is claimed that he was the originator of the process of rolling cylinders around a broach. This method was first described in the *Dental News Letter*—see page 13 of the issue for October 1856.

Dr. Clark, who was recognized as one of the skilled operators of our country, was also a talented man in other walks of life.

Robert Arthur of Baltimore was the first to make known the cohesive properties of gold. This will remain his enduring monument in dentistry. He is also famous as having been the first to receive the degree of doctor of dental surgery, granted to him by the Baltimore College of Dental Surgery. He was a diligent student as a youth and obtained a good classical education, which included Greek, Latin, French, and German. At an early age, thrown upon his own resources, he was apprenticed as a "printer's devil." Later he became acquainted with Chapin A. Harris, who induced him to study dentistry, and he entered the first class of the Baltimore College of Dental Surgery, and with his only classmate, Dr. R. Covington Mackall, constituted the first graduating class—March 9, 1841. Arthur began practice in Baltimore, and later went to Washington, then to Philadelphia, where he filled the offices of dean and professor of the principles and practice of dental surgery in the Philadelphia College of Dental Surgery, which he assisted in organizing.

He made frequent literary contributions to the profession. His best literary work was "The Treatment and Prevention of Decay of the Teeth: a Practical and Popular Treatise" (Philadelphia 1871). In this work he advocated his system of separating teeth for prophylactic purposes—commonly called "Arthurizing."

Arthur is credited with being the first to discover the cohesive properties of gold by annealing. This occurred in Philadelphia, and Dr. Louis Jack first called his attention to this circumstance. In 1857 Dr. Arthur wrote his "Treatise on the Use of Adhesive Foil," in which he presented to the profession the principle of welding the annealed gold by means of serrated pointed instruments. As a teacher and writer, Arthur occupied an important place in the profession.

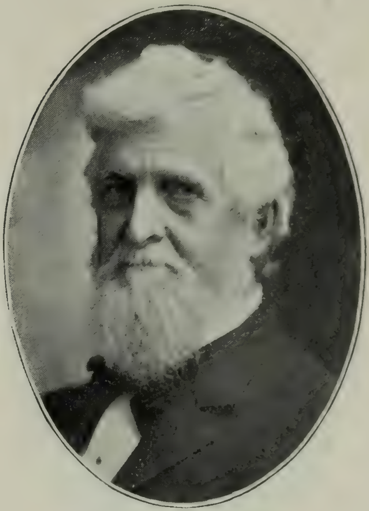
ROBERT ARTHUR,
Baltimore, Md.

A year after Dr. Arthur had called the attention of the profession to the cohesive properties of gold, a young man began the study of dentistry with his uncle, Dr. Joseph Clowes, of New York. He developed skill in both operative and prosthetic work, and early earned for himself an enviable reputation. The early dentists were adepts in the use of napkins, by this method keeping the saliva from coming in contact with the cavity and filling material. In 1862 this young man, *Sanford Christie Barnum* of New York, conceived the idea that made practical the use of the rubber dam in dental operations, which discovery he generously gave to the profession, and made himself known as the profession's benefactor, also making it possible "to govern the tide and command it to go hence, that we may approach the wreck on the beach and repair the breaks in the hull, that the ship may continue to sail on its mission of usefulness."

SANFORD C. BARNUM,
New York, N. Y.

ROYAL W. VARNEY,
New York, N. Y.

Royal William Varney of New York was a student of Atkinson, and later on of Corydon Palmer. Varney developed marvelous skill as an operator, and had few equals, probably no superior, in the manipulation of heavy gold foil, with which he built magnificent monuments to his skill. He was a natural mechanic, and designed a set of instruments for packing gold, known as the "Varney pluggers," which are in demand to this day. He was an earnest investigator with the microscope, had a musical taste, and was an able performer upon the violin.



W. W. ALLPORT,
Chicago, Ill.

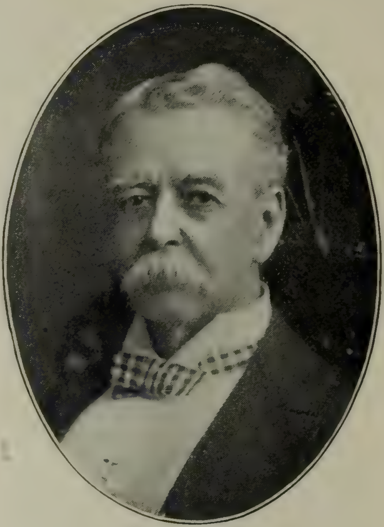
Walter Webb Allport of Chicago was another of those wonderful operators whose fillings had contour, finish, and lasting properties. Allport was a student of Amos Wescott, an excellent dentist of the early days. He located at Chicago in 1855. He was an enthusiastic microscopical investigator, and instrumental in organizing the Chicago Microscopical Club. He was editor of the *People's Dental Journal* and organizer and promoter of many dental societies.

William H. Atkinson of New York, familiarly called the "Grand Old Man," another microscopical investigator, was an early authority on dental therapeutics, pathology, and histology. Through his efforts the first school of microscopy was established in New York, under the management of Professor Carl Heitzman. Atkinson was one of the finished operators of his day, his fillings ranking with the best.

W. H. ATKINSON,
New York, N. Y.

Henry J. McKellops of St. Louis was a man whom all respected for his superiority as an operator. He had few if any equals when it came to the manipulation of heavy foil, especially gold-platinum foil, with which he wrought wonders. Only those who have seen McKellops' operations doing good service thirty or forty years after their insertion can appreciate just what he did for operative dentistry.

Marshall Hickman Webb of Lancaster, Pa., was a boy genius in carving violin-bodies and in the manufacture of mechanical toys and water-wheels, and also an assiduous student in dental pathology and histology. He soon became an expert in dental operations and attempted to fill all classes of cavities with cohesive gold, no matter how difficult and inaccessible they were. He was an inventive genius rarely equalled, and his improvements of the Bonwill electric

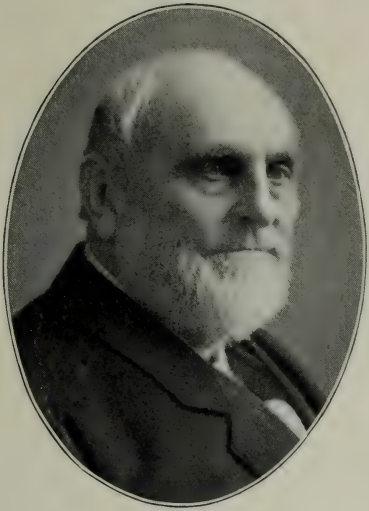


HENRY J. MCKELLOPS,
St. Louis, Mo.

MARSHALL H. WEBB,
Lancaster, Pa.

mallet gave him professional prominence, and the fillings he built of cohesive gold reached the highest excellence.

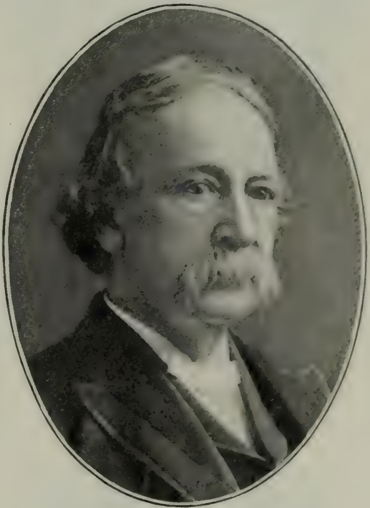
Contour was his watchword, and as a clinician he had few if any equals. In the preface to his excellent book, "Notes on Operative Dentistry," the keynote of which is cohesive gold, he beautifully expresses his ideals when he says: "In literature, sculpture, painting, and music, and in operations such as dentists ought to perform, it is not the aim of a Dryden, a Michael Angelo, a Raphael, a Beethoven, or a Varney to write, carve, paint, bring forth a 'concord of sweet sounds,' or to produce in gold that which requires but little time and skill, and is simply cheap and inartistic; it is the endeavor of the *artist,* whatever be the sphere of his efforts, to produce the perfect and the beautiful."



WM. H. MORGAN,
Nashville, Tenn.

William Henry Morgan of Nashville was born in 1818, in Kentucky, of revolutionary stock, and was graduated March 1848 from the Baltimore College of Dental Surgery. A year afterward he located in Nashville, Tenn., where he soon acquired a lucrative practice and rapidly attained high rank in American dentistry. He was an enthusiastic dental society attendant, and twice filled the office of president of the American Dental Association.

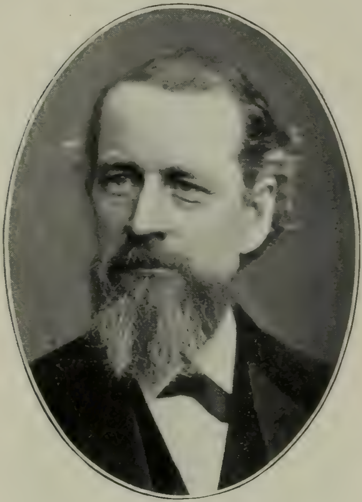
He was an acknowledged leader of the profession in the South, and was chief organizer (in 1879) and first official head of the Dental Department of Vanderbilt University. He was a talented speaker, and was one of the expert manipulators of gold foil in this country.



WM. H. DWINELLE,
New York, N. Y.

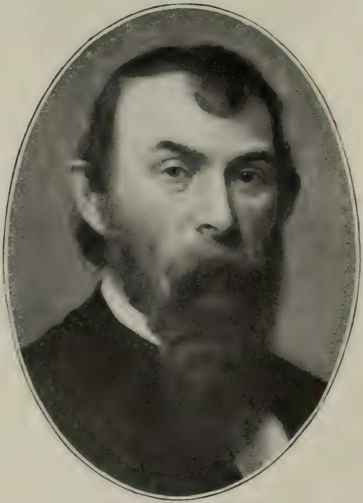
William Henry Dwinelle of New York was a talented dentist, an inventor, an expert wood-engraver and draftsman, and was an associate with Chapin A. Harris in 1847-49, in editing the *American Journal of Dental Science.* He was another devotee of the microscope. Dr. Dwinelle was a pronounced advocate of cohesive gold and of the contouring of fillings. For originality he was in the same class with Bonwill. He was a great reader, an amateur in the fine arts, and one of the brilliant men of early dentistry.

Jonathan Taft of Ohio was a man whom all loved and respected for his mildness of manners, his skill as an operator, and his knowledge of our science.



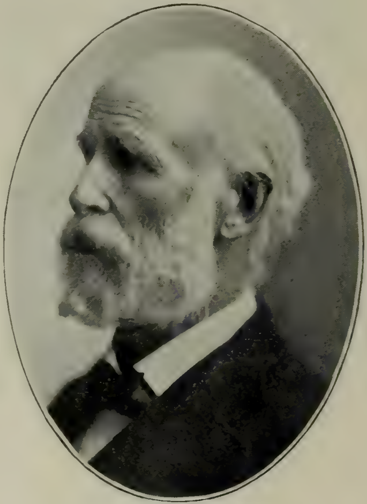
JONATHAN TAFT,
Ann Arbor. Mich.

Dr. Taft's face is missed in these annual meetings, where he was a familiar figure, but his work as a teacher, writer, and clinician will live as long as the pages of dental history are read.



CORYDON PALMER,
Warren. Ohio.

Corydon Palmer of Ohio is perhaps the oldest practicing dentist in the world. He was born in 1820 and for many years has been prominent in dental society work and as a skilful operator. He was in the same class with the men whose pictures have been shown, and of him Dr. Allport said: "Palmer was the best filler of teeth in the world." He was present last year at the congress at St. Louis and received much attention on account of his skill and his long service in the profession. His presence at this annual meeting is an encouragement to the younger men, and a source of gratification to his many old friends.



G. V. BLACK,
Chicago. Ill.

The last picture is that of *Greene Vardiman Black* of Chicago, who without doubt has done more to develop dentistry as a whole than any other one living man. His contributions to operative dentistry, comparative dental anatomy, histology, bacteriology, pathology, and in fact to our whole science, make him the best-known and best-respected dental authority that America—yes, the whole world—has ever produced.

There are many other talented men

whose likenesses I might show, but time will not permit. These are some of the men who have given our profession caste, and who, through their versatility and skill, have materially contributed to the profession.

George D. Prentice says: "There is only one stimulant that never intoxicates—duty. Duty puts a clear sky over every man, in which the skylark of happiness always goes singing."

Our pioneers did their duty, as they saw it, to humanity and their profession, and have left their names indelibly written on the pages of the history of dentistry.

THE NECESSITY FOR AND A METHOD OF PRESERVING THE INTEGRITY OF THE INTERPROXIMAL SPACE.

By Dr. W. R. CLACK, Clear Lake, Iowa.

(Read before Section II of the National Dental Association, Buffalo, July 25, 1905.)

IN considering this subject it would seem that every dental practitioner should be so well aware of the necessity of returning the teeth to their original mesio-distal diameter as to make it unnecessary to write any more essays on this topic.

If, however, I am to judge the present state of affairs as existing in our profession by the operations which are continually coming to me for correction, then I am compelled to say that each month all our dental journals should contain one or more essays on the subject under discussion.

My home is in Clear Lake, Iowa. During the summer months we have thousands of temporary residents. For several years a goodly number of these people have consulted me regarding the condition of their teeth and gums.

These summer residents come to our lakeside from every quarter of the United States, so that what I say regarding operations seen in their teeth does not refer to any special locality nor to the dentists in that place, but to all sections of the land. In fact, patients have consulted me who came from the hands of professors in our colleges, members of our dental examining boards, and men very prominent in the cities where they live as well as in our state and national societies.

And what do I find in so far as this relates to the operations on their teeth? That every condition that should bring comfort to the patient and which should lead to the salvation of the human teeth has been ignored.

If there were contacts made on these fillings in the approximal surfaces, in ninety out of one hundred cases the contacts were not points, but masses of metal which extended from the occlusal surface to the gingival margin, and from the lingual to the buccal margins. Where there are such surfaces in contact, we know that the tooth has not been returned to its original mesio-distal diameter, consequently we have no interproximal space.

Modern dentistry no longer consists in excavating most of the decay from a cavity and filling the cavity without regard to the conditions that prevail in normal dentures. The dentist who neglects to correct the faulty environment that was the cause or result of the initial decay has stopped far short of his duty, and is as criminal as the surgeon who in operating for appendicitis simply evacuates the pus pocket and does not remove the cause of the trouble.

The performance of dental operations on the human teeth does not remove the cause of the trouble unless there has been a complete eradication of that condition which led to the original cause of the breaking down of the tooth.

Where the interproximal space is not protected by making a point of contact on fillings or crowns we have a condition which invites disease. Where we deal with cavities in the approximal surfaces and do not return the teeth and parts to a condition of normality we have abnormal conditions, and these always invite disease.

The object of making surgical and dental operations is the same, *i.e.* to change the existing abnormal conditions, thus permitting of a return to the normal. Having given you my ideas of what I feel is our duty to our patients, I shall close my remarks by calling your attention to three cases from my practice.

In attempting to interest other men in any subject we must present either theories or conditions. I do not believe in dwelling upon theories if I can present conditions for your consideration. To this end I have brought with me a number of plaster-of-Paris casts. The conditions illustrated in these casts are copies of conditions I found to exist in and around the teeth to which I wish to call your attention.

The illustrations are copies of the plaster-of-Paris casts enlarged forty diameters. I will pass duplicates of the original casts that you may examine them more closely.

Fig. 1 shows the loss of an upper right first molar, with cavities of the third class in the disto-occlusal surface of the first bicuspid and the mesio-occlusal surface of the second bicuspid. Any attempt at mastication on these teeth was productive of great discomfort and pain. This patient, a boy eighteen years of age, called on me first on March 31, 1905; he came to have the bicuspids and both lower first molars—which were in the same condition—extracted.

The pulps were removed from both bicuspids and the root-canals filled. A week afterward a gold filling was made in the disto-occlusal surface of the first bicuspid, involving the lingual cusp, the buccal cusp being well supported by dentin. There was absolutely no dentin left in the second bicuspid, so I had to resort to a gold shell crown with long contact points, as seen in Fig. 2. This cast, taken June 17, shows how quickly nature will do her part if we only make it possible. The gum has cuddled down behind the protection of those contact points, and the interproximal spaces are completely filled with healthy gum tissue.

FIG. 1.

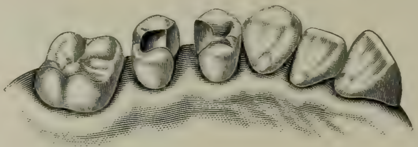


FIG. 2.

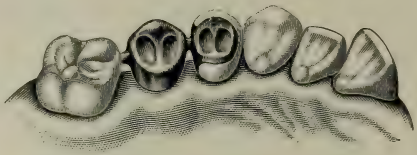


FIG. 3.

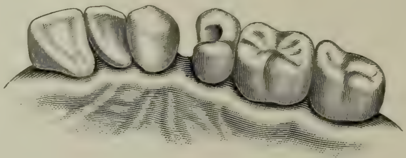


FIG. 4.

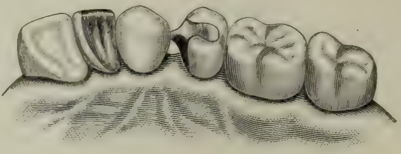


Fig. 3 represents the condition I found existing on July 12, 1903, in the teeth of a patient whose age I did not ask, but who is a grandmother. You would not expect any restoration of tissue at that age. The upper left first bicuspid was missing; cement fillings had been placed in the mesio-occlusal surface of the second bicuspid and the linguo-distal surface of the upper left lateral incisor. Both teeth were pulpless. The architect who made the filling in the lateral incisor evidently believed in "extension and contact," and had as intelligent a conception of those principles as some other men who assure us that they "have practiced those things for years"—for he had his filling in "contact" with the canine from incisal surface to gingival margin and he had "extended" his filling until the entire interproximal space was filled with a mass of cement.

I made the operations you see on July 12, 1903, and the impression from which Fig. 4 was made was taken November 6, 1904. Notice the restoration of gum tissue between the canine and second bicuspid.

The patient whose teeth are represented in Fig. 5 was twenty-five years of age when she came to me on July 7, 1902. She said, "Doctor, I want these teeth—indicating upper right first bicuspid and first and second molars—out, and a plate made that I can eat with. For two years I have not eaten a meal in peace."

The teeth on the lower left side posterior to the first bicuspid were missing so that she was compelled to use the teeth on the right side. The second bicuspid was missing. There was a cavity of the third class in the disto-occlusal surface of the first bicuspid. A year or more previously a cement filling had been placed in this cavity over a mass of decayed dentin; cavities of the second class in the mesial, occlusal, and distal surfaces of the first molar, and in the mesial and occlusal surfaces of the second molar, had been filled with amalgam. All these fillings were leaking. The filling which had been made in the occlusal surface of the second molar had fallen out.

FIG. 5.

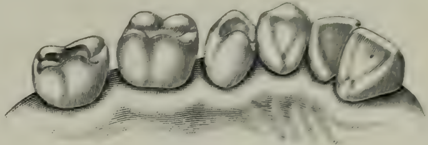
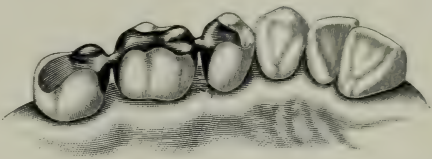


FIG. 6.



A refusal on my part to extract the teeth resulted in my making the fillings shown in Fig 6. The impression from which this illustration was made was taken November 7, 1904.

The restored tissue is not a mass of vascular, unhealthy granulations, but firm, healthy pink gum tissue wholly filling the interproximal spaces.

A NEW BRIDGE ABUTMENT FOR THE ANTERIOR TEETH.

By JOHN OPPIE McCALL, A.B., D.D.S., Binghamton, N. Y.

THE writer believes that for a long time the dental profession has more or less consciously felt the need of a strong bridge abutment for the anterior teeth which will not necessitate cutting off the natural crown, will not show gold, will have greater permanence than the open-face shell, and one which will be adaptable to a close, hard bite.

It is with the hope of filling this want that the attachment herein described is offered. It is especially applicable to canines, but may be used on centrals and lateral incisors, and even (with suitable modifications) on bicuspids. In a word, it consists of a gold inlay through which runs an iridio-platinum wire post fitting into the root-canal and extending out from the tooth approximately to support the bridge. It is confined entirely to the lingual surface, and being finished flush with that surface of the tooth it shows no gold and offers no obstruction to a close bite. The only gold shown is that of the edge of an approximal filling, the insertion of which is advised in order to protect the tooth from approximal decay. The iridio-platinum post gives strength and rigidity, while freedom from decay is insured by having all the margins either self-cleansing or otherwise protected, as will be shown.

Indications. (1) Posterior bridges supported anteriorly on a canine. (2) Anterior bridges in which it is used once. (3) Anterior bridges in which it is used twice, as it may be thus applied with suitable precautions. It should not be used as an abutment for anterior wing bridges, unless the dummy be provided with a lug to prevent torsion.

Preparation of the tooth. First devitalize the pulp, remove it, and fill the apical region of the canal. After a suitable rest insert a gold filling on the approximal surface with which the proposed bridge will come in contact. This filling must be extended so that its labial and incisive margins will be in self-cleansing areas after the bridge is in place. The labial margin of this filling will be the only gold shown, and need be extended no farther than necessary to make it accessible to the tooth-brush. Cervically, it must be extended under the gum unless the bridge is to be constructed on the self-cleansing principle. The cervico-lingual angle must be extended on to the lingual surface. This filling need not be deep, but must be made with cohesive gold and anchored like a contour filling. Its object is to provide a gold contact for the approximal margin of the inlay, this margin not being accessible to the burnisher when inserting, or the tooth-brush after insertion. By the use of this filling all the margins of the inlay which have contact with enamel margins are easily reached by the burnisher and tooth-brush, while the slight interproximal line of gold does not detract appreciably from the artistic appearance of the work. In teeth exceptionally free from approximal decay this filling may be omitted at the discretion of the operator, but it is a safeguard whose use is strongly advised.

THE INLAY CAVITY.

Enlarge the opening on the lingual surface through which the canal was filled), without undercutting it, to the size shown in A, Fig. 2. The labial wall of this cavity must be parallel with the root-canal or sloping from it to the incisive edge (see line A–F, Fig. 1); the cervical wall should be at a right or acute angle with the labial wall. In the approximal surface of the tooth in which the gold filling is inserted cut a notch (G–A–F, Fig. 1) extending into the inlay cavity and making it part of that cavity, its margin, A–F, being in line with the root-canal. The object of this notch is to provide room for the exit of the iridio-platinum wire from the tooth without interfering with the bite of the opposing lower tooth (see Fig. 1), and need be no deeper than is necessary to secure this result. The line G–A–F shows the shape of the notch best adapted to prevent torsion or lingual displacement—it being understood, of course, that this notch is cut not only in the gold filling, but in the dentin between the filling and the root-canal (see Fig. 2), which latter gives the strength necessary to accomplish this result. It follows, therefore, that if such a notch seems likely to prove a source of weakness to the tooth itself, as in slender teeth such as laterals, it should be modified to the form indicated by the dotted line G–A, and it may even be advisable to cut this line G–A and its corresponding cavity wall at right angles to the labial wall. If the filling has been properly put in, the entire margin G-A-F will be found to be in the gold, thus insuring freedom from decay on its approximal surface. The principal care in preparing this cavity must be to avoid undercuts in the cavity, and especially in the margin A–F, since these would prevent inserting or removing the inlay in the line of the root-canal. Undercuts already existing in the cavity may be filled with cement. In the dentin lingually from the root-canal cut a step as shown at D, inclined slightly from the root-canal to avoid binding. This step is practically a continuation of the notch, and serves the same purpose, being especially indicated if the notch cannot be used in its first form. It should be used even if the post fits the canal tightly, since it is sometimes necessary in inserting the completed bridge to do a little extra drilling in the canal if the abutments are not quite parallel. The depth of the step depends on the liability to displacement to which the individual case will be subject, this being greater, for instance, in lower bridges extending from canine to canine, than in others. In this latter case, too, the notch will be of slight depth since there is no opposing bite on the

FIG. 1.

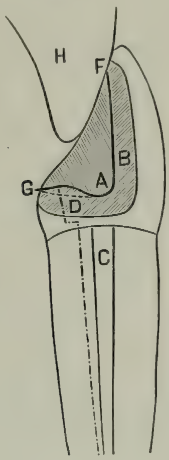
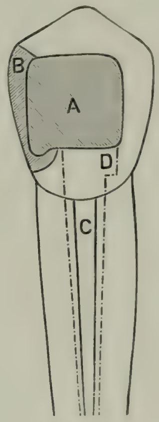


FIG. 2.



Approximal and lingual surfaces of upper canine. (Dot-and-dash lines indicate enlargement of canal for post.) A, Inlay cavity opening into root-canal; B, Gold filling; C, Root-canal; D, Step leading to root-canal; H, Lower bicuspid.

lingual surface. Danger from this source is not great, however, if the posts are well fitted.

Drill out the root-canal to admit a post of the proper size, drilling approximally and lingually but not labially, as shown by the dot-and-dash lines.

Bevel all enamel margins so that the inlay will finish well.

THE ABUTMENT.

The post is of the regulation iridio-platinum wire, rounded, and of a length suited to the needs of the case. At the opening of the canal it is given a right-angle bend, and after emerging from the notch it can be bent to suit the case, extending far enough from the tooth to support the dummy and to give attachment for solder.

Remove the post, place a pellet of gutta-percha in the opening of the root-canal, and take a plaster impression of the cavity including step D. Dry this thoroughly and run a die of Melotte's or similar low-fusing metal, small enough to go in a plunger swage. Take a piece of pure gold No. 36 gage and swage to the die. Trim nearly to the cavity margins. Try the matrix in the tooth to be sure of an accurate fit, burnishing slightly into the root-canal to indicate its position. Drill through this depression into the canal, and swage again to correct any accidental distortion. Place it in the cavity, insert the post through the opening into the canal, and melt in a little sticky-wax to hold the post and the inlay in proper relation. Cool, and remove carefully; invest, and attach the post to the inlay with a little 20-k solder. Try in the mouth and burnish to the cavity margins. Remove, invest again and fill the inlay with 20-k solder, extending it out on the post to connect with solder when completing the bridge. The investment should extend to the cavity margins, and no more solder should be used than is necessary to fill the inlay to those margins, as any excess will make grinding necessary, a procedure which cannot well be done outside the mouth without risk of spoiling the margins.

The abutment is now placed in the mouth together with the additional abutment, a wax bite and plaster impression is taken, and the bridge is completed in the usual manner. In taking the bite the wax should not be allowed to cover the post, but in the impression be sure the plaster covers it. Allow the plaster to harden thoroughly, and use care in removing it to avoid breakage. After completion make slight undercuts in the inlay and tooth for the cement.

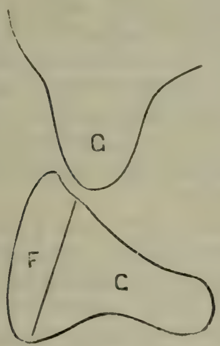
SETTING.

The bridge should be set with thin creamy cement, as in setting porcelain inlays. Hold it firmly in place and burnish the edges of the inlay to the tooth while the cement is still soft. After the cement hardens grind down to the margins, and burnish and polish as in finishing a gold filling.

If it should be desired to use this as a middle abutment, gold fillings could be inserted in both approximal surfaces, notches cut in each filling, and the post split after it emerges from the canal. In the bicuspid, the notch would be an approximal extension of the sulcus, and in this case also there should be an approximal gold filling. In any case make the inlay cavity of good size, as a small cavity increases the difficulty.

At this point a word about the self-cleansing bridge may not be amiss. It is probably within the experience of every dentist who has anything to do with bridge work to hear patients say that if they had known how dirty bridges were they would have had plates instead. Not only do we hear complaints of uncleanliness and offensive taste, but when a posterior bridge with facings adapted tight against the gum is removed, we find the gum hyperemic from the irritation of fermenting food packed into the recesses thus provided. How much better is it to cut back the facing leaving $\frac{1}{16}$ to $\frac{1}{8}$ of an inch space between facing and gum through which the brush and quill pick may have free play! Nor is this incompatible with an artistic result in many cases, since few people show the gum back of the canine to a noticeable extent in talking or smiling, and by tilting the facing in slightly at the neck the space may be made inconspicuous, especially if the back of the facing be ground parallel with the gum. (See Fig. 3.) Also, by tilting the facing in and rounding off the cervical edge we can avoid the possibility of catching the cheek on this edge in masticating. Of course, cases will present themselves in which the facings must be placed against the gum, but in the many cases which can be made self-cleansing, the patients will have a lively appreciation of the efforts made for their comfort.

FIG. 3.



Cross section of bridge cusp. G, Gum; F, Facing; C, Cusp.

The application of the self-cleansing principle to the bridge abutment, described in this paper, makes for the long life of the attachment inasmuch as it enables the wearer to keep the cervical margin of the gold filling clean, the preservative effect of which upon the inlay is self-evident. This of course does not apply to anterior dummies, which are much easier to clean. The abutment itself makes for the long life of the tooth, inasmuch as it has no edge of gold extending under the gum, as is the case with the gold shell and the Richmond, which irritates the pericementum, a factor not the least potent among its advantages.

While not an easy attachment to make, it can be constructed by any dentist of fair ability, and the artistic result, with the consequent pleasure of the patient and the increased remuneration which artistic work commands, will repay the operator for the extra trouble. To be successful the work must be done with the greatest care, or permanent results will not be achieved. Properly constructed it should be a source of satisfaction to both patient and operator.

In the case illustrated in this article the attachment described was used on the canine as shown. A Carmichael attachment was placed on the bicuspid, leaving its entire buccal surface exposed, and a full gold shell was adapted on the second molar (not shown in the illustration). In this way no gold was exposed to view except the tip of the molar facing and the second molar shell, the distal filling of the canine not being apparent. The facings were also made self-cleansing. In this case it was necessary to secure anchorage in the canine as well as the bicuspid and molar because the bicuspid had been weakened by carrying a wing bridge with a full cusp. The result was an esthetic, solid, clean piece of work which gives every promise of reasonable permanence.

PORCELAIN.

By D. O. M. LE CRON, M.D., D.D.S., St. Louis, Mo.

(Read before Section II of the National Dental Association, Buffalo, July 25, 1905.)

PORCELAIN is a material in which the beauty of the results well repays the highest exercise of art. In the hands of a skilful operator, the natural organs can be imitated by it so closely that it is almost indistinguishable. In this branch of our profession many failures have been experienced, and many of the fraternity gave it up with disgust—due, we may say, to lack of confidence and ambition to make further investigation. No one can become skilful in and master porcelain until he becomes familiar with all the details connected with its composition and manipulation. Experience alone is our best teacher. To be successful in any walk of life, let it be mechanics, engineering, trade, or the professions, we must turn about-face, cut off all the avenues of failure, and have sufficient self-confidence to boldly face all emergencies that may arise.

We must have some definite purpose in view and persistently strive to meet it by thought and action. Any success worthy of attainment costs constant effort and is gained only by hard work and self-confidence.

Marden says: "How long would it take a young man to become successful who puts himself into an atmosphere of failure and remains in it until he is saturated with the idea? How long would it take a man who depreciates himself, talks of failure, thinks of failure, and walks like failure—who is always complaining of the insurmountable difficulties in his way, and whose every step is on the road to failure—how long would it take him to arrive at the successful goal? Would anyone believe in him or expect him to succeed?"

The majority of operators who meet with failure in this field begin by doubting or depreciating themselves, or by losing confidence in their own ability. The moment we harbor doubt and begin to lose faith in ourselves we capitulate to the enemy. Every time we acknowledge weakness, inefficiency, or lack of ability, we weaken our self-confidence, and that is to undermine the very foundation of all achievement.

The pioneers of modern porcelain work had crude appliances and materials at their command compared with what we have today. They were men who thought and experimented, and we may rest assured they met with many failures. Those who had the perseverance and indomitable will to surmount the many difficulties, in time reached the goal.

My many failures in this line of work instilled in me that desire to make investigations, in order to learn the cause and how to overcome them.

During the last sixteen years I have devoted much time to this class of work, experimenting with the different porcelain bodies and furnaces that were put on the market from time to time. To reach the highest point of success and be master of the situation, we must learn to manipulate the porcelain so that it will retain its form; calculate on the shrinkage to maintain its outline; ascertain the true fusion by experimenting; secure a thorough knowledge of the furnace; and, last but not least, teach the eye to blend the colors properly. This can only be accomplished by repeated experiments and a determined effort on our part to master the situation. All can learn the ceramic art who have the perseverance and the ambition to attain the front rank of the profession.

Two years ago I prepared a paper on the fusion, crushing strength, and shrinkage of the different porcelain bodies on the market, and gave the results I obtained after three years of experimentation.

Since the foregoing date my son, Dr. Robert Le Cron, and I have made further investigations along the same line and found the results corresponded accurately with my former experiments. In our opinion the fusion of porcelain is to be considered of supreme importance and is the greatest factor to be dealt with in the final results. Our experiments convince us that a more uniform and greater crushing strength is produced in porcelains when fused at their normal fusion, the exact colors under such conditions being reproduced as they were intended to be.

It is true that temperatures can be judged by the color of the furnace, and fusion of porcelain can be approximately ascertained by an experienced eye within 50 to 200 degrees Fahrenheit. Much depends, however, on the susceptibility of the eye of the observer to light; also the degree of illumination under which the observation is made. It will be observed with a thermo-electric pyrometer that in bright daylight we will first notice the dark red heat appear in the furnace at 1075° to 1100° F., and the dull orange heat at 2025° to 2050° F. In a dark room at night a furnace will indicate the same colors—the dark red heat at 750° F., and the dull orange heat at 1750° F.

Because of this fact and its serious consequences, and having determined the crushing strength, the shrinkage, and the fusing-points of the different porcelain bodies, we commenced a series of experiments with pure gold and platinum combined in different definite proportions until pellets of a given size were obtained which fused at the respective temperatures required for the fusion of the different porcelain bodies.

With this metal in proper proportion and a soapstone crucible so constructed we have a pyrometer with which we are able to properly fuse any of the porcelain bodies without the danger of over-baking, no matter how the current varies or how irregular the heat may be. It is very important, however, that the metal be placed side by side with the work, so that the same relative heat shall absolutely reach the two, to assure perfect fusion. We must also be governed by the bulk of porcelain to be fused. For all large pieces of work it is a good idea, when the melting-point of the metal is reached, to turn back the rheostat handle one button and hold it there for from ten to thirty seconds, according to the bulk of porcelain, so that it may become thoroughly fused. If this method be carried out in all of its details, it furnishes the most simple and inexpensive means of obtaining correct results.

The melting-points of pure gold and platinum cannot be expressed accurately numerically, nevertheless a scale may be arranged from them.

We found with a mixture of pure gold and platinum that for every five per cent. more of platinum the temperature is raised about 105 degrees Fahrenheit.

The determinations, however, became uncertain with more than 25 per cent. of platinum, as it requires a heat above 2500° F. to fuse the pellet. The temperature corresponding to the melting-point of an alloy, say of 85 per cent. of pure gold and 15 per cent. of platinum, would represent a degree of heat of 2330° F.

On account of the durability of the alloys this method of measuring temperature is not expensive, and I assure you it will meet our requirements.

We will next take the composition of a few of the porcelain bodies, giving the results of the investigations we made.

Professor Seger says: "Even if nature does not grant to the human eye a look into her most secret workshops, if she does not show how she changes clay into shale, sand into sandstone, or forms a crystalline lime or marble out of the deposits of calcareous shells; if she has not, up to this time, permitted us to determine the conditions under which, in heaps of detritus formed by friction and weathering, the like constituents move to certain centers of concentration and become new crystalline formations; yet speculative science, by a comparison of the products upon which these unknown influences have worked for an unlike duration of time, or with unequal intensity, furnishes a hold as to how these may have originated and brings us closer to the workshop of nature—for the most part not accessible for direct observation."

However valuable the data which the physical investigations of clays offer in regard to their behavior in the plastic condition in soft burning, or the chemical analysis for the recognition of the constituents which prove harmful in the manufacture, as in the investigations of Bischof for the judging of the degree of fusibility, nevertheless these investigations do not yet suffice in all cases for characterizing sharply the nature of a porcelain, and it happens often that the scientific results and the discoveries of practice deviate more or less from one another.

The cause for this is found in the fact that the chemical and physical analyses allow only a few mutual relations to be seen and do not give information concerning all conditions. The physical analysis teaches us to know the relation between the porcelain substance and the mineral fragments, and explains a series of phenomena that are more or less independent of the chemical composition. The chemical analysis gives us hardly any information concerning physical properties, and for the behavior in high temperatures conclusions are only possible under the supposition that all substances indicated by the chemical analysis can enter into it.

The chemical analysis of the porcelain we are using may be of some interest to the profession. At least, we were so much interested in its composition and action under heat that we had four of the different porcelain compounds analyzed, and herewith I give the percentage results:

	No. 1.	No. 2.	No. 3.	No. 4.
Silica	66.95	77.52	71.10	68.86
Alumina	16.70	11.25	12.3	1.87
Lime	2.10	1.42	2.13	1.70
Magnesia	0.30	0.30	0.30	0.30
Alkalies	12.35	8.39	10.64	25.59
Tin oxid	..	..	Trace	1.30
Loss on ignition	1.60	1.12	1.48	0.38

The research we have made from the great publications of Professors Seger, Brogniart, Bischof, Richters, and others, on the study of the physical properties and the relation of these to the chemical composition leads us to conclude, as regards the character and action, when found, of the above four porcelain bodies, approximately as follows:

No. 1: As reported this consists of approximately 96.50 per cent. of the feldspar albite, and 3.50 per cent. of hydrated calcium oxid—slaked lime. (Albite is a feldspar, usually of a white color, containing soda instead of potash.) The feldspar alone fuses at a high temperature to a white glass. The addition of the small percentage of lime would make the mixture more fusible and also more opaque.

There would be no chemical action in fusing the feldspar, and the lime would chemically combine with the silica upon fusing, forming a silicate of lime.

No. 2 consists of approximately 75.50 per cent. of the feldspar albite, 25 per cent. free silica, and about 2.50 per cent. of hydrated calcium oxid. The free silica and lime would combine with the feldspar chemically upon fusion, the whole fused mass becoming a silicate.

No. 3: This is composed in all probability of approximately 64 per cent. of orthoclase feldspar, 33 per cent. of free silica and 3 per cent. of hydrated calcium oxid. (Orthoclase is a potash feldspar.)

In fusion the free silica and lime would chemically combine with the feldspar, making the entire fused mass a silicate high in silica of the composition as given in the certificate of analysis.

No. 4: This as reported consists of a mechanical mixture of caustic alkali (mostly potash) silica, hydrated calcium oxid and tin oxid, which have been fused together and ground up. When these ingredients are fused together they combine chemically and the resultant fused mass becomes a silicate of potash, lime, and tin. In the present state there would be no further chemical action upon the fusion, as it would simply result in a remelting of the already fused material which has been powdered.

It has an approximate composition of 70 per cent. silica, 25 per cent. alkalis, 2 per cent alumina, 2 per cent. lime and 1 per cent. tin oxid. all combined together chemically due to the first fusion as silicates. In all the porcelain samples analyzed, the alkalis alone would make a transparent glass, while the alumina and lime make an opaque-like enamel. According to Brogniart's reports on fusibility of porcelain, the higher the percentage of silica the less fusible is the mixture. The higher the percentage of alkalis the more fusible becomes the mixture. The higher the percentage of lime the more fusible becomes the mixture until the proportion of lime present becomes greater than the silica. When the proportion of lime present is higher than that of the silica, the mixture becomes less fusible.

The alumina, if not present in too large quantities, would make the mixture more fusible than if silica were in its place, but it does not affect the fusibility to any large degree.

It is evident that the metallic oxids, provided they are pure, produce definite colors, and they are used in ceramic art as follows:

Cobalt	oxid . . for	all shades of blue
Nickel	" . . "	brown.
Copper	" . . "	green.
Manganese	" . . "	brown and violet.
Iron	" . . "	brown, yellow, or red.
Uranium	" . . "	yellow.
Chromium	" . . "	green or red.

The noble metals, gold, platinum, and the oxid of iridium for red, gray, and black respectively.

Remsen says: "We have learned that there is a close relation between the different kinds of physical change and chemical change, and that one kind of change is capable of producing other kinds. We have learned how to distinguish chemical action from other kinds of action, the loss of their own properties which the substances suffer being a prominent characteristic of chemical action. And, finally, we have learned that the name 'chemical affinity' is given to that which causes substances to act chemically upon one another, but that we do not know what chemical affinity is—we only know what effect it produces."

ETHICS.

By A. H. PECK, M.D., D.L.S., Chicago, Ill.

(Read before the Dental Society of the State of New York, at its thirty-seventh annual meeting, Albany, N. Y., May 12, 1905.)

WE are children of the past. Into our lives are built forces and tendencies that come through the ages from a time concerning which history is silent. Through the centuries man has been slowly climbing from barbarism to civilization, from selfishness to unselfishness, from egoism to altruism—and the ascent is not yet ended. What a picture would hang before us, could we have a faithful portrayal of the process by which the race has come to its present condition! Yonder in the dim past, man emerging in self-consciousness, improvident, self-contained, brutal. Then the birth of sympathy, mutual helpfulness, and moral standards. We are far from being perfect. Selfishness still seeks hospitality in our hearts, and brutality lurks around the corner ready to waylay and overcome us. But the imperfections and weaknesses of today are far from proving that no progress is being made. It is easy to so fill our minds with the evil that is all about us—with the crime which defies control and shames our modern civilization—as to cry that the world is dropping downward instead of climbing upward—that we' are degenerate children of our fathers. We need to take long-time views of life, to mark carefully the flow of the stream which runs through the centuries, lest we mistake the eddy for the current and form mistaken judgments concerning humanity's real tendency.

The study of origins is always interesting, even if not uniformly profitable. Men have busied themselves in seeking for the sources of moral life. When, in our fierce struggle for existence, did men first give room to sympathy? How was it that out of selfishness unselfishness was born? Where was it, and when, that men rested from their mutual aggressions and began to help each other? The pages of history are silent, and no voices come to us from those primeval days. Interesting as is the quest, it is a vain one, and for our present purpose unimportant. We have to do with men as they are and society as it is. It is our business, in full recognition of the existence of ethical standards and of present-day conditions, to ascertain what we ought to do and to be. What is the true function of a man in the social organism? And what special opportunities and duties are ours as members of a profession?

There are two great outstanding principles of conduct which have application to every member of society and upon the recognition of which the welfare of society depends: viz, (1) a man shall inflict no injury; (2) he shall be helpful. Have we not here a summary of conduct within which may be brought all our relations and activities?

Turning first to the negative side, a proper ethical standard will keep us from being harmful. This may at first glance seem a very poor and inadequate setting forth of moral duty, but when we come to consider it in all its laterals it will be found to hold tremendous significance. It means far more than that we shall refrain from murder, and theft, and arson. These are crimes recognized and punished by laws. These are crimes so abhorrent to respectable men that they hold no temptation for us. But there are injuries perpetrated of which the law takes no cognizance, extra-legal wrongs which involve neither fine nor imprisonment. And they are not unimportant wrongs judged from the point of view of individual or social welfare:

> Who steals my purse steals trash; 'tis
> something, nothing;
>
> . . . .
>
> But he that filches from me my good
> name
> Robs me of that which not enriches him
> And makes me poor indeed.

Just here we come upon a temptation to unethical living that touches the best of us, and against which we must do battle if we are to live worthily. It is a temptation to which professional men, possibly, are peculiarly susceptible, our own profession not excepted. Take a concrete case: Two men begin the practice of their profession in the same place, at the same time. Each has his living to make, his professional reputation to establish. Each desires to make friends, attach to himself a *clientèle,* succeed. Is it not hard for these men to be absolutely fair in their treatment of each other? Does not jealousy often lead to innuendo, and hint, and shrug of shoulder, if not to specific and open charges? Do not misunderstand me. I am not saying that this is always so; possibly it is not often true; but the temptation is there, and the demand for a lofty and noble ethical standard is there also. From a purely selfish point of view, the attempt to rise by the fall of another is poor policy. It is true that

> Men may rise on stepping-stones
> Of their dead selves to higher things,

but no man ever climbed higher in manhood by trampling on another.

This temptation multiplies its strength when our competitor for the favor of the public is for any reason disagreeable to us. Nothing is more difficult than to be absolutely fair to the man whom we dislike. He may be endowed with superior skill, but it is hard for us to acknowledge it. He may be industrious and honest, but we are looking for evidences of his laziness or proof that he is not trustworthy. If there be anything certain about ourselves, it is that the average man judges righteous judgment about the one who is personally offensive to him only by summoning all his manhood to the task.

In the practical work of our profession, anything less than our best is an injury. And the best of which I speak is not simply the best that we can do, but the ideal best, that best which is the product of our most conscientious and patient study and toil. We cannot excuse ourselves for poor workmanship by saying that we have done our best. That may be true as concerns present attainment, but it is not true in view of what we might do and be. Our constituency have a perfect right to expect from us not only that they shall be preserved from malpractice, but that they shall receive the most skilful treatment possible under existing knowledge and practice. This means that we must thoroughly qualify ourselves for the practice of our profession in order that we do not violate one of the fundamental principles of ethics. Many a man seems to fancy that if he keeps himself sober, honest, clean, he may be somewhat less than the best possible practitioner without blame. Ethics reaches beyond and below habits and qualities that are usually called moral. We must learn that to be incompetent is to be immoral.

Must I speak of the grave injury done to society when one of its members is corrupt? Even if there be no necessity for such a word growing out of our own moral delinquencies, yet is speech demanded by the assumption met on every hand, that our morals are nobody's business but our own. "Have I not the right to do what I will with my own life?" is a cry not infrequently raised by those who are wasting powers of mind and body in dissipation and licentiousness. To this query the answer must be a mighty No! Were we in this world simply detached and unrelated units, the case would be far different from that which really exists. We are bound together whether we will or no. As a wise man of old once wrote, "We are members one of another." No man can injure himself without injury to others. The drunkard spoils other lives than his own; the libertine can never be alone in his debauchery. It would be no small matter—this perversion and ruin of a life—even were we not tied together as we are. To waste natural forces, to be dwarfed in character, to rob ourselves of helpfulness, to lose noble aspirations, to willingly drop from the plane of manhood to that of the beast—all this is unspeakably sad. But we are elements in a social organism, units in a great composite, and to be anything else than our highest selves is to rob society of that which it sorely needs and to which it has an inalienable right.

While we are on this subject, suffer a word as to the relation of moral character to professional success. It is true that men have won a high place for themselves at the bar, as teachers, as physicians, as dentists, who have not realized in their own living the high moral standard of which I have been speaking. The community has sought their service and rewarded them generously for their professional skill. But let no man deceive himself by supposing that the success achieved is all that would have been won had they been other than they were. Whatever we may be ourselves, we do not want impurity to be brought in touch with those we love. The drunkard would keep his son from drunkenness; the lecherous man—if he have any remainder of manhood—protects his daughter from contamination by all the safeguards that he can throw around her. To the highest possible professional success character is requisite. We may go far without it, but never so far as we could with it. People are neither blind nor indifferent to immorality in those to whom they entrust the health of their loved ones. Pure women have an instinctive shrinking from an impure man, even though he hide his soul behind a fair mask. On the low ground of utility, it pays to be straight, and sober, and clean, and manly.

Possibly we may go farther and consider habits which are not distinctly within the normal categories. The uncleanly, unkempt man not only injures himself but society. For the men of our profession there are no two opposing words to be spoken about this. The close physical contact which the practice of our profession necessitates makes the personal habits of dentists a matter of first moment. No one wants a dirty finger thrust into his mouth, or a foul breath blown into his face, or an unwashed person in close contact. But there is more to it than this. By neglecting cleanliness and personal appearance, we are robbing our patients of a pleasure to which they have a right, inflicting upon them an unpleasantness that need not be, doing them an injury.

Having thus hurriedly touched upon some of the details of the negative side of ethics, we turn to the positive aspect of mutual helpfulness. Somehow, in the long, upward climb of man from barbarism, he has learned to consider and promote the welfare of others. Perhaps the better statement would be that as man has come to consider others, and because of this, he has ascended in the scale of being. Certain it is that civilization in its deeper meaning is only another name for sympathy, thoughtfulness, and mutual helpfulness. This has always been a large and important factor in the happiness of the race, but never has it been of such moment as now. Yesterday, men separated by the distance of a hundred miles were as thoroughly detached from each other as though they lived on distinct planets. Yesterday the world was large, and its different peoples knew little and cared less about each other. But now the world has shrunken and the dwellers in the utmost parts of the earth have come near together. Man is familiar with modern facilities for intercourse and we have long since not only ceased to wonder but have forgotten what they mean to civilization. They mean that, in proximity at least, all men are members of one great brotherhood. We are neighbors who a little time ago were unknown to each other. Ethics takes on an added meaning as human relations come closer, and as the telegraph, the telephone, the railway, and the steamship annihilate time and space.

Modern conditions give new force and value to ethical principles. We cannot, if we would, escape from relationships. We are in and parts of the ceaseless process by which manhood is made or marred, by which the social order is strengthened or weakened. And each man for himself must determine what he will be, not only in and for himself but also for those to whom his life is tied, those who may be helped or harmed by that which he is and does. Never has evil been so potent and far-reaching in its influence; never has good possessed such power to bless mankind. We live next door to each other. The battle of life is being fought at short range. All life is intensified and increased in meaning.

Under such conditions as now exist, how shall a man best discharge moral obligations? The first answer, the one that leaps into all fair minds, is "by being a man." No higher eulogy can be passed upon us than that which Shakespeare puts into the mouth of Marcus Antonius:

His life was gentle; and the elements
So mixed in him, that Nature might stand up
And say to all the world, "This was a man!"

The first and largest contribution that we make to society in helpfulness is in being right. No matter what our limitations in natural or acquired ability, whether known or unknown, rich or poor, every man has the privilege of giving to his generation that which the world most needs—a sterling character. Mark you, however, this must be a reality and not a mask if it is to be of real value. All the world may be a stage, but we are more than players. The man who assumes to be that which he is not, so that we may accomplish selfish ends, degrades manhood and dishonors the high things to which he pretends. The Christian church has a high mission and a man may well court a right to the honored name which links the centuries together; but the man who seeks the fellowship of church life for no higher purpose than to give him standing in the community or to strengthen his professional position is less worthy of respect than the devils in hell. Mahomet, in the Koran, tells of seven hells, the lowest and most intolerable of which is for hypocrites. Whatever Mahomet's vagaries in other respects, he was evidently sound here. What is true of the church is also true of benevolent and fraternal organizations of all kinds. It is beneath manhood to use such means to boost us in our professions. Let us stand or fall on our own merits. Let us be men.

In looking about us today upon conditions which exist in the life of which we are a part, that which I have been saying receives constant emphasis. We find public and private greed, betrayal of sacred trusts, the prostitution of high gifts, scheming and trickery in political affairs, oppression of the weak by the strong, graft, and boodle, accepted as necessary evils. Is our nation hastening to decay? Are we on the brink of governmental ruin? No—and for this reason: Back of the seen and recognized actors in governmental affairs is a great body of unknown citizens who are honest and who demand honesty. Let no man make you believe that this is a nation of villains. The blacklegs and boodlers loom large, but they are as nothing in number compared with that inconspicuous body of moral agents which control the destinies of our country. So long as the rank and file of American voters remain true to high ideals of manhood, so long will the unfit and corrupt have their little day and then be sent into obscurity. What we need to do is to steadily increase the number of men with lofty ideals of citizenship—men who, whether on the farm or in the professions, stand like the eternal hills of righteousness. Every such man is a public benefactor. Every such man, although the great world may never know of his existence, is a priceless contribution to democracy and pure government.

When we go inward from the greater to the less, from general government to the single community, how our estimate of the importance of an honest, manly man increases! Have you ever lived in a little town where everybody knows everybody else? In such a town it may well be that you have known some man not great in anything but goodness; a man of limited means, it may be, a man of little scholarship, a man who did not have a famous name—just a plain, simple, everyday sort of man. But if that man was unselfish and honest, industrious, kind, clean, full of friendship, you know what he meant to the life of his town. How much he did that money could never have done! What impresses he left upon those growing up about him! How he enriched all simply by that which he was! And this is the high privilege bestowed upon each of us. Some of us will never achieve fame; neither will great wealth be ours. Some of us may spend our lives within narrow boundaries; but wherever we are, it is within our power to live so well that the old world will be a more wholesome and desirable place just because we are in it.

Does this exhaust the possibilities of helpfulness? Far from it. Some of the best things in this world can be won only by fighting for them. Good ethics include warfare. Whatever may be the immorality of international wars, it is certain the time is not yet when ethical progress can be achieved without conflict. Nature is not always a safe moral teacher, but her lessons here are full of meaning. Through the long ages in which life has been developing on this planet we are told that one constant law has been in operation, that of "survival of the fittest." In the terminology of science, the most fit has been synonymous with the strongest—the victorious in battle. The fit in the ethical domain are the right. They may be strong or weak in means and physical ability, but if they would win battles they must fight. It will not do to sit still and inert, comforting ourselves with that deceptive old saw, "Truth crushed to earth will rise again." So she will, if she has help enough, but not without it. In our profession this truth has its pertinent application. We are not to be chronic "scrappers" or seek conflict for the sake of the excitement which it brings. So far as possible we should live peaceably with all men. But when the issue is joined between right and wrong, when false standards are raised or measures proposed that hold in themselves danger for our good name and ability to render useful service, then let every manly man take arms and enlist for the war. It is only the coward who hides when great issues are at stake and the help of honest men is needed.

The life of the professional man naturally tends to narrowness. We have a certain specific task. Our work is much the same day after day, year after year. When we read we instinctively turn to that which will inform us and strengthen us in the work which we have to do. And this is legitimate and praiseworthy; the man who is not ever learning soon drops behind. We owe it to our patrons not only to secure thorough preparation for our work, but to keep abreast of the ever-growing knowledge in our profession. But the danger is that we shall become men of one idea. This is the danger of all specialism. In a sense we may and must be just that; in another sense we should be all-around men. We are men before we are dentists, and manhood's obligations should never be forgotten or ignored, whatever may come to us of strenuous professional toil or of high achievement. Life is more than knowledge, more than compassing our professional aims. Its values lie chiefly in things that cannot be measured by the money we earn or the fame we win. Friendships, unselfish friendships, affection binding us together, these are things best worth while in life. Missing them, we miss the perfect joy of living.

And we have a duty to society that cannot be executed except through our conscious and earnest discharge of social obligations. I do not now mean "social" in the sense of functions, dress parades, etc., although that side of life has its value. By social obligations I mean obligations to our community life, obligations of good citizenship. The life of the community will depend upon the attitude of its members toward it. Some of the most serious dangers that threaten us, some of the most potent evils from which we suffer, find their explanation in the indifference of the better classes. Does it make any difference whether the city administration be in the hands of honest or dishonest men? Does it make any difference whether the streets are kept clean, garbage collected, sanitation looked after, the water supply kept pure? Surely there can be but one answer to these questions. But how are these desirable ends to be gained? Certainly not by the withdrawal of good men from all interest in such matters. Who are we that we should refuse to do our part in making the conditions under which we live such as they should be? What right have we to call ourselves devotees of a high ethical standard, when we refuse to have any part or lot in applied ethics as found in the administration under which we live? "No time" is the plea of selfishness, and we ought to be ashamed to make it. What we mean by it really is that we are not willing to turn aside from congenial and remunerative professional work to do our part in securing the interests of society. But if ethics has any practical bearing upon life anywhere, it is at just this point.

As a profession, we have our codes and ethics, fundamental, clean, unmistakable. We know what is expected of us in our relations with our patients and with each other. No one will urge the plea of ignorance in attempting to justify himself for unprofessional conduct. Because all this is so well known, I have not taken time to repeat it in this paper. It has been my purpose rather to look farther afield, to take a broader view of ethics than that which is included in any formulated enactment. As we stand to-day upon the summit of the years and look back along the way our profession has journeyed, we have every reason to rejoice and take courage. Not only has our practice been lifted up into an assured and honorable position, but the members of our profession have constantly enlarged their ideals of life. We have a right to pride ourselves on the large and honorable place which we occupy in the world's life. To be permitted to minister so largely as we do to the welfare and happiness of our fellows, to be able to relieve pain, restore and preserve health, make trying physical conditions more tolerable, is something for which to be profoundly grateful. And we all know that our profession is still in its infancy. Great as is the progress that has been made, the coming years will witness greater. We have not come to the place where discovery is exhausted, and nothing remains but to pursue the well known. Each year adds to the knowledge and skill of our members. Each year marks a distinct advance.

Shall we content ourselves with growth in technical knowledge? Rather let us court and seek for progress in all that enters into the ideal member of society. Man has not yet reached the perfection of manhood. Society is not yet ideal. Even we as individuals know that we are not all that we may be.

> "Unless above himself he can
> Erect himself, how poor a thing is man!"

Unless we can slough off the imperfect for the increasing perfect, not only in professional methods but much more in qualities or character, we shall fail of getting the highest meaning out of these lives of ours. The failure, if such there be for any of us, will not be from lack of knowledge, from ignorance of that which is true, from absence of clear call to the heights of life, but from our own choice, from which we take to ourselves the lower rather than the higher. To every man comes the vision of noble manhood. Clear and alluring stand out the heights which the world's great souls walk. The way to these may be long and rugged, but it is distinct and may not be mistaken. With ourselves lie the issues of life. We know that we have the power to be clean, honest, true, unselfish, altruistic; such men as every generation needs, such men as in any and every age brighten and bless the world. But to see the vision is not enough; the men who win are not only those who see the gleam, but who follow it. Baboushka, so a Russian legend says, was working in her cottage when the three wise men passed by on their way to find the new-born King. "Come with us, Baboushka," they cried, "and we will lead you to the King." "Not so," she answered, "for my tasks are not yet done. Go you on, and later I will follow." But when the tasks were ended, the wise men had disappeared and she could not find the way. And ever since, on Christmas eve, she comes to the people's homes in search of Him whom she might have known but for her fatal postponement.

When the gleam of duty shines before us, when we may make the world a better home for man by our service, when manhood and righteousness may be exalted through our loyalty, may we halt not nor hesitate in "following the gleam!"

THE RESTORATION OF THE FUNCTIONS OF MASTICATION SUBSEQUENT TO THE REMOVAL OF PORTIONS OF THE MANDIBLE, INCLUDING THE TEMPORO-MAXILLARY ARTICULATION.

By Dr. FREDERIC FREEMAN, Boston, Mass.

(Read before Section I of the National Dental Association, Buffalo, July 25, 1905.)

THE device which I am about to describe applies to cases in which portions of the mandible have been removed, including the temporo-maxillary articulation. The object of the appliance is to restore the function of mastication and the articulation, and also to fulfill cosmetic indications.

In order to accomplish these objects, it is necessary to construct an appliance that shall fill the space produced by the removal of the teeth and bone, holding the remaining portion in place, and allowing nearly the normal motion of the parts.

In presenting this subject to you, I wish to state that in the construction of these appliances I have simply applied established ideas and principles to a new use, thus demonstrating the possibilities of facial prosthesis.

It will be both interesting and necessary, in a retrospective way, to briefly outline what had been accomplished up to the time of my previous introduction of this subject in 1900.

In the *Dental News Letter* of April 1857, page 227, an apparatus to remedy the entire loss of the mandible and teeth is described by C. A. DuBouchet, M.D., D.D.S., invented and constructed by MM. Fowler and Preterre of Paris.

In the DENTAL COSMOS, vol. xxxv, page 973, we find that Dr. Claude Martin of Lyons, France, exhibited at the World's Columbian Dental Congress, at Chicago, in August 1893, a collection of appliances. After being worn a few months, the object having been accomplished, they are removed and replaced by a hard-rubber plate and teeth of similar form.

In the DENTAL COSMOS, vol. xxxiii, page 730, Albert Westlake, D.D.S., Elizabeth, N. J., reports on a case of facial restoration. I will quote from his paper: "The final plan was to make for the upper left molars two gold crowns, which were soldered together, and at their buccal junction there was soldered a stiff knobbed wire, projecting downward at an angle of about forty-five degrees. A gold cap-crown was also made for the lower left canine, and to the labial surface of the crown was soldered another short knobbed gold wire, extending in the direction of normal occlusion. A steel spring, similar to that used in the flexible connection of the dental engine with the handpiece, was repeatedly cut off and tested until the required resilient power was found in a length of thirty-two coils. This spring was electro-plated, and the looped ends slipped over the knobs on the crowns, which had been previously cemented on the molars and canine respectively. The action of the device was very gratifying, for when the patient closed her mouth the remaining teeth were brought into normal apposition."

In the DENTAL COSMOS for June 1899, page 517, Dr. Naaman H. Keyser of Germantown, Pa., reports on a case of restoration of the mandible.

I wish to call your attention particularly to a fact which has undoubtedly suggested itself to your mind, that while these appliances were, in a way, probably quite satisfactory and ingenious, they had practically but cosmetic objects in view, and did not restore the function of mastication.

Many of you undoubtedly recall the case I above referred to, namely the one presented in 1900. The right half of the mandible having been removed, as far as the symphysis, and the wound having entirely healed, the case presented itself to me one month after the operation.

History of the first case. A man, age forty-five, passive temperament, reconstructive qualities good, endowed with an extreme amount of endurance.

After making a somewhat exhaustive search through the literature of dentistry in the hope of finding some suggestion which might enable me to devise an appliance, I found nothing on the subject, and speaking to a number of dentists relative to the subject I received from them no encouragement whatever.

The teeth in this case were almost perfect, sound, strong, and healthy. There were fourteen teeth in the maxilla, the third molar having been extracted. On the remaining left half of the mandible were two incisors, canine, two bicuspids, and the first and second molars.

In constructing this appliance the upper right canine, the two bicuspids, and two molars were crowned and soldered together at the coronal surfaces. To the upper second molar was attached a ball-and-socket joint. All the remaining teeth on the lower left half were crowned, with the exception of the incisors. On the lingual side of these teeth runs a bar extending from the last molar crown on the left and soldered to all the crowns. This bar, which extends to conform to the contour of the entire lower arch and is made of iridio-platinum, is elliptical in shape posterior to the canines and incisors (the ellipse being horizontal), and squared as it runs backward. The bar is meant to be worn permanently. On the distal end of the buccal side of this bar is a heavy platinized gold tube or sleeve, into which the rod from the ball slides, thus allowing the jaw to protrude that the incisors may come together.

A lug is soldered on top of the distal end of the bar, to hold one end of a plate fitted to the bar in place. The other end is held by a pin passing through the front side and under the bar. To this plate are attached artificial teeth, and it can be removed by the patient at will. After completing this appliance, and having placed it in the patient's mouth, he was able to articulate intelligibly, the facial deformity was almost entirely obliterated, and the function of mastication was restored to a very satisfactory degree.

In October 1904 it was my pleasure to have a conversation with our esteemed member, Dr. Stanley of New Bedford, Mass., who related to me some facts concerning the case which I am about to describe. Before entering into a description however, I wish to extend my thanks to Dr. Stanley for his interest in the case to which I now wish to call your attention. It is one of extreme interest to us as dentists, and likewise to the general surgeon, as it may be the source of relief to patients afflicted with this distressing deformity.

History of the second case. Mr. B., age thirty, of good physique, presented himself to me in November 1904, in the following condition: The right side of the mandible having been removed as far as the left first bicuspid, and the wound having healed nicely, the mouth presented the following peculiarities:

The cicatricial tissue formed by the new attachments of the muscles of mastication on that side had a tendency to shorten considerably these muscles, and a general contraction of the neighboring soft tissue had supervened. This consequently was a great factor in the deformity that existed on that side. The portion of jaw remaining, having no opposition, was drawn toward the opposite side.

In these cases, after operation is performed and the wound has healed, the remaining half of the jaw being drawn out of its habitual position by the contraction of the muscles and wound tissue, the occlusion is imperfect, and the jaw rotates inward on an axis which passes horizontally from before backward through the temporo-maxillary articulation, in such a manner that the occluding surfaces of the teeth incline inwardly, and the outer or buccal surface of the jaw upwardly. When the patient brings the teeth together the buccal surfaces of the lower strike the lingual surfaces of the upper. If the coronal surfaces are brought together by force, the jaw will immediately rotate on its own axis. During muscular relaxation the jaw is drawn toward the median line by the contraction of the muscles and cicatricial tissue, and to such an extent that it is impossible for the patient to articulate properly and the function of mastication is completely lost. A description of the teeth remaining intact is necessary to a clear conception of the case, and also because it bears on the construction of the appliance.

In the maxilla the following teeth were present, apart from the six anterior teeth of which the left central was supplied with a porcelain crown. On the left side, the first bicuspid, the second and third molar; on the right side, the second and third molars, the missing teeth having been extracted some years previous.

Construction of the apparatus. These six anterior teeth were bridged to the two right molars to form the base of the anchorage to which the socket is attached. These teeth were crowned with 20-karat gold, No. 26 gage, and soldered together, making one continuous piece from the left canine to the right third molar. The socket was soldered to the coronal surface of the right third molar crown at almost right angles, allowing it to drop as far as possible. This socket is about $\frac{5}{8}$ inch long, $\frac{5}{16}$ inch wide, and $\frac{1}{4}$ inch thick, has a face, which is bolted to the anterior surface, and is provided with an elliptical opening (the long diameter of the ellipse being vertical) for the passage of an iridio-platinum rod, which is attached to a ball of gold, within the cavity made by the socket and face. This rod extends forward about $\frac{1}{2}$ inch from the face of the socket. The construction of this ball-and-socket is practically the same as the one used in the previous case.

The two bicuspids and the three molars on the remaining portion of the mandible were fitted with telescope crowns, the inner crowns of 22-karat gold, the telescope crowns of 20-karat No. 26 gage. To these five telescope crowns is soldered the heavy gold bar which takes the place of the extirpated portion of the jaw, bent to the form of the arch, and over the outside of this bar is soldered a piece of gold so constructed as to simulate the missing teeth. On the distal end of this gold bar is attached a sleeve, into which the rod from the ball-and-socket joint slides, and which increases to a very great degree the amount of motion allowed.

By the peculiar arrangement of the telescoping crowns this artificial piece can be easily removed by the patient.

In making the bar to which the telescope crowns are attached, great care has to be taken to have the bar of the exact length and curved to conform to the probable outline of the natural mandible. On the length of this bar depends the whole secret of successfully restoring the remaining portion to its normal position.

To the under side of the bar is attached a section of vulcanite rubber of sufficient size and shape requisite to supply the deficiency of contour, and also to furnish a larger area of contact for the cicatricial tissue to operate on while the movements necessary to mastication are being carried out.

In these cases, with the appliance adjusted, the opening of the mouth is not equal bilaterally. This irregularity is due to the position of the ball-and-socket joint, it being placed anteriorly to the temporo-maxillary articulation on the opposite side. However, this is scarcely noticeable, and in no way interferes with the natural functions of the jaw.

Additional literature on the subject can be found in the following publications:

DENTAL COSMOS, vol. xxxiii, page 822.
London Review, vol. v, page 279.
Dental Record, vol. x, page 198.
American Journal of Dental Science, 3d series, April 1889, vol. xxii, page 558.

THE POSSIBILITIES OF MODERN DENTISTRY.

By F. W. KNOWLTON, D.D.S., Akron, O.

(Read before Section III of the National Dental Association, Buffalo, July 25, 1905.)

THE advance made in recent years through scientific research is stimulating the dental profession along lines whose possibilities would place oral prophylaxis before the world, as commanding a place second to none in importance among the many measures which are being promulgated for mutual good. Many in the dental profession see the necessity for this, but the public as yet does not fully realize its importance. Medicine, surgery, dentistry, and sanitation are being practiced along lines as laid down by bacteriologists with far more success than ever before. Yet when we consider the conditions ordinarily existing in the oral cavity, as revealed by this science, is there not good ground for the belief that dentistry is destined to be recognized as of far greater importance to mankind than has been conceded in the past? It is not the intention to convey the idea that there should be any less stress put on the value of the teeth, or the importance of their care for the sake of the teeth alone, but the profession should endeavor the more to instill into the minds of the public the necessity of a clean healthy mouth, as a requisite to the acquirement and preservation of a sound body.

Were this fact generally known, oral conditions that receive little or no attention would be more fully realized, and with better prospects for results. Unquestionably our civilized modes of life and methods of preparing foods are largely the cause of the increasing prevalence of sordes at the gum line, thus furnishing a suitable pabulum for the development and multiplication of micro-organisms. This results in the deterioration of the environment of the mouth, and necessitates greater vigilance, in order to combat this ever present menace to health and happiness.

As nearly all the diseases of bacterial origin gain entrance through the mouth, these conditions become a means of contagion and a prolific source of chronic disorders of stomach, kidneys, and lungs. Many forms of contagion and infection could be directly and effectually combated by dealing with the mouth-conditions in a practical and systematic manner. The dangers arising through expectoration are universally conceded. Laws bearing on this repulsive practice are in force.

Yet slight precautions are taken, commensurate with the needs, toward meeting mouth-infection—even in cases of that dread disease, tuberculosis. Periodic change of mouth-environment, brought about largely by mechanical expulsion of its contents, and the actual contact of the brush with that vulnerable part, the gum line, thus restoring functional activity of gum tissue, are chief requisites from a hygienic point of view as concerning both personal and public interests.

Several years' experience as dental examiner for the Diamond Match Company has afforded an excellent opportunity for observing conditions of the mouth of a class of people who, through ignorance and neglect, as a rule fail to follow any of the necessary precautions to a sufficient extent to preserve the teeth or to keep the surrounding tissues in a state of comparative health. They do not appreciate that the conditions existing within the mouth are in the least detrimental to their general health. Statistics compiled from my records of the 2000 examinations made every three months, and covering a period of about five years, give

36,906 recorded examinations among males and females, varying in ages from fourteen to fifty years. Of this number 5207 males needed 8675 fillings, 2282 teeth to be extracted, and 441 teeth to be treated; 4269 females needed 7489 fillings, 1019 extractions, and 312 teeth to be treated.

An essential means of precaution to be used to avoid serious trouble makes necessary in my work the placing of many teeth for extraction which might under other circumstances be treated and saved. The girls and women being generally considered as more unfavorable subjects has caused me to go through their records for a period of four and one-half years to January 1905, with the following results:

In 2036 cases the first examination shows that 1299, 64 per cent., needed 3546 fillings, 404 needed 790 extractions, and 133 needed 153 teeth treated. Among this number of people there was a total, during four and one-half years, of 6628 fillings, 868 extractions, and 253 teeth treated. Out of these 2036, there were 276 who were under surveillance quarterly for the entire four and one-half years; four of these having full upper and lower plates, and fifteen requiring neither fillings, extractions, or teeth treated, or 7 per cent. The 257 (93+ per cent.) remaining, with need for operative dentistry, presented 519 cavities at the first examination, or an average of 2+ to each person; the remaining time there were 1040 fillings inserted, or 1— filling a year for each person. For extractions there were 56 at the first examination, and 32 the remaining time. Of teeth to be treated there were 27 at the first examination, and 32 the remaining period. The number of cavities estimated on first examination are very conservative indeed, while the figures for extracting and treating represent very closely the necessities existing at whatever time the examinations were made. Those who needed ten or more fillings the entire period numbered 62 people, with 793 fillings to their credit. Those needing less than ten fillings numbered 195 people, with 766 fillings. Gum conditions presented with fully as important considerations as those involving the teeth, together with opportunity for demonstrating the degree of effectiveness which simple and rational means afford.

Review of my records, together with knowledge of conditions among the employees who have been under surveillance any considerable length of time, also affords an opportunity of knowing somewhat the results, immediate and far-reaching, consequent to the observance of means looking to comparative cleanliness, as well as the urgent need for adoption of active measures in order that the rising generation be relieved from the consequences entailed through the present system. There is a growing belief that the public schools should be a qualified source of knowledge on all topics pertaining to the welfare of the young. The readiness with which school boards are permitting inspection in other lines should encourage the various dental societies to persist in their efforts with increased vigor, to the end that dental inspection with compulsory oral hygiene be installed in all institutions of learning. Such encouragement of habit, for moral, mental, and physical development, would prove both eminently valuable and practical.

IMPACTION OF THE THIRD MOLAR, AND THE USE OF THE ELEVATOR IN ITS REMOVAL.

By C. P. McLAUGHLIN, D.D.S., Cincinnati, Ohio.

(Read before the Cincinnati Odontological Society.)

ONE of the most annoying conditions the dental profession has to contend with in the oral cavity is the inflamed tissue and pus pockets in the neighborhood of the lower third molars, due to the impaction of these teeth. I will dwell on the lower, as they are more liable to serious disturbance than the upper, which is due to the difference in the anatomy of the two jaws. At the lower second molar the rising of the external oblique ridge for the formation of the anterior border of the coronoid process causes a thickening of the buccal bony covering of the root, while at the third molar this ridge rises to a level with the border of the alveolar process, making the bony covering on the buccal side of the root about one-fourth of an inch thick. This fact is of importance with reference to the extraction of the third molar.

The lower second and third molars are fixed in alveoli hollowed out on the lingual side of the body of the bone, rather than in a process or ridge on the bone, as with the teeth anterior to them. This condition makes them more difficult to extract. The thickest point, lingually, of the mandible is at the second molar, due to the rise of the mylo-hyoid ridge. Lack of space between the second molar and the ramus is the cause of its comparatively frequent malposition and impaction. We lance the overlying tissue, slough back with acids, and often the patient returns with the same condition, until we are compelled to extract, or attempt to extract, the impacted tooth. We use treatment, hoping to relieve the condition, because we are timid about attempting these extractions. I venture to say that seventy-five per cent. of lower third molars have curved roots, and one of the greatest mistakes we make is the endeavor to extract such a tooth with forceps, using the inward and outward motion, which is liable to fracture the inner plate of the mandible. Unless the second molar is missing, or has a large cavity or filling on its distal surface, I never use the forceps for extracting these teeth. In such cases the elevator is useless, for the second molar is here used as a fulcrum.

With the use of the S. S. White right and left elevators we get a direct back and upward force, which is the necessary one for the removal of these teeth in the majority of cases, especially in those with curved roots. Such direction of force it is impossible to obtain with the forceps. If the tooth be up in the arch it takes very little force with the elevator for its removal, even though the roots be curved. Once in a great while I sacrifice the second molar, and let the impacted tooth come forward as it will. [Casts were passed around showing that the third molar, after the extraction of the second molar, will move forward sufficiently in a year's time to nearly fill the gap, while still preserving a fair articulation with the occluding teeth above.]

I do not advise this method unless the second molar be badly decayed, or the case be unusual in other respects. The close proximity of the inferior dental nerve to the roots of the third molar is another anatomic feature which has a marked bearing on the etiology of disturbances in this region. X-ray pictures are of great assistance in locating and giving positions of non-erupted third molars. I believe that when a third molar does not act as a substitute, its early extraction is called for, even though it be free from decay, and in this way many a good second molar might be saved, for its distal surface can then be easily reached with a brush.

I use the forceps for extracting most upper third molars, as the force from the elevator is liable to loosen the tuberosity. [The essayist here exhibited an upper third molar which he had extracted with an elevator, breaking away with it a portion of the tuberosity. The roots were much curved, and a small supernumerary tooth lay crosswise and between its roots.]

I consider this a rare specimen, as the situation presented looked like a simple case for extraction, but it proved very difficult. The tuberosity was dissected away from the gum tissue after the extraction of the tooth.

Miss B., age about twenty-two, was referred to Dr. Locke to have several roots removed which were irritating the tongue. The patient informed Dr. Locke that she had been operated on twice by physicians for necrosis, and that the pain had not ceased, except when the parts discharged pus. Preparations were at the time being made for another operation. On examination it was found that the patient could open her mouth about half an inch only, and could not get the natural occlusion. One of the operations had been made at the mandibular angle, the other at the condyle, where pus was flowing freely at this time. Upon examination it was found that the upper right third molar was missing, and could not be located with a probe. An X-ray picture was made by Dr. Kumler, which showed this tooth embedded in the maxilla, overlying the position of the second molar, high up behind the antrum, the articulating surface of the crown pointing toward the posterior surface of the antrum. Dr. Locke decided to remove the tooth, and I was called to assist him in the operation. Dr. Denman administered chloroform. The forceps were useless in this case, as the patient could not open her mouth.

With the elevator we removed the second molar, and through its socket the disturbing third molar was then removed, and eight or ten badly broken-down teeth in other parts of the mouth were also extracted.

In a few days the discharge of pus had completely ceased, and today the action of the mandible is perfect, and the occlusion normal. Without the aid of the X rays this tooth could not have been located.

A FEW DENTAL WRITERS OF THE EIGHTEENTH CENTURY.

By **D. W. FELLOWS, M.D., Portland, Me.**

(Read before Section II of the National Dental Association, Buffalo, July 25, 1905.)

THE profession of dentistry was born in the city of Paris at the beginning of the eighteenth century. In 1700 provision was made for the examination of those who wished to practice surgery of the mouth, but of the struggles of the young profession during the next quarter-century we know but little, though history has handed down the names of several who practiced dentistry during that period and who won recognition as intelligent and educated men. In 1728 a foster-father arose in the person of Pierre Fauchard, whose work on dentistry was published in the year just named. This was a systematic treatise in two volumes of over eight hundred pages.

We may probably accept as correct this author's statements as to the conditions prevailing at the time of his writing.

He says, "While surgery in general has recently been much perfected and many important discoveries have been made in anatomy and in modes of operating, and many learned and curious observations published, dentists, however, do not find among them anything at all sufficient to guide them in their operations." The reason for this is, he says, "that the part of surgery which pertains to diseases of the mouth has, to the present time, been very much neglected."

"Writers on anatomy and surgery," he continues, "either have not spoken at all of diseases of the mouth, or have treated them very superficially, in order that they might not seem to omit anything necessary to the completeness of their system." "The most celebrated surgeons," he says, "having abandoned this part of the art, or, at least, having cultivated it but little, their negligence has caused a class without either theoretical knowledge or experience to embrace it and to practice it empirically."

That caries and other diseases of the teeth were as prevalent then as now, may be inferred from his statement that "Those who preserve all their teeth in a healthy condition to advanced age are very few." This author tells us that it was his purpose from his youth to practice surgery, and while engaged at times in other occupations he never lost sight of this, and finally became the pupil of Alexandre Poteleret, surgeon major in the royal army.

Fauchard's treatise on the teeth was the first published in any language worthy of such a title, and as such it shows that considering the time in which he wrote, he had a broad and deep knowledge of the subject, great familiarity with details, and keen judgment. A very brief abstract will illustrate, in some degree, the nature of his work. He designates, as he says, more than one hundred really distinct diseases of the teeth. He speaks of teeth as bones, saying that they are the whitest, hardest, and most solid bones of the body. This error in designating the teeth as bones was not corrected until nearly a hundred years later. He gives a good description of the twenty deciduous teeth, and says that they are not without roots as some authors pretend, and that under these twenty teeth are to be found the germs of the permanent teeth, which appear when the first are lost.

Erosion is described as we know it today, and the name given to the affection. "The nervous membrane which covers or lines the cavity" of the tooth, that is the "lining membrane," is often referred to, and this term was constantly used for more than one hundred and twenty-five years.

Fauchard did not believe in the existence of worms. "Some authors," he says, "as well as the common people, have believed and still believe that caries and all pains of the teeth are caused by dental worms, which little by little gnaw the tissue of the bony fibers and the nerve filaments." "The existence of these worms has been reported by illustrious authors, but having never seen them, I can neither deny or admit the fact," "but," he concludes, "while admitting that such a thing is not a physical impossibility, I do not believe that caries of the teeth is thus produced and certainly not in all cases."

The "worm theory" of toothache has prevailed in Eastern countries for a thousand years.

When Fauchard was compelled to disagree with celebrated authors he did so with becoming modesty, often appearing to be distrustful of his own judgment, as in his condemnation of the practice of cauterizing the ears for the cure of toothache—a practice recommended and minutely described by Valsalva, professor of anatomy at Bologne.

Another noted surgeon advises placing sulfuric acid in the cavity of the tooth. Fauchard says, "Without wishing to attack the merits of so able a surgeon, I venture to say that this practice is very dangerous." He then enumerates the evil effects that may follow, and proposes for the cure of toothache three remedies: (1) Oil of cinnamon and oil of cloves, either mixed or separate. (2) The actual cautery. (3) Filling.

He is convinced that tartar is deposited from the saliva, and that it originates from the calcareous matter held in solution in that fluid. He condemns what he says is a common practice—seating persons on the floor for the extraction of the teeth, and advises that every care be taken to preserve all teeth that are specially desirable for use or ornament. When necessary he does not hesitate to extract teeth for pregnant women—not believing, as many do, that it is likely to cause serious symptoms.

Our author's description of the gums is very clear and concise. Many of his remedies for difficult dentition seem somewhat whimsical, but his directions for lancing the gums when the symptoms seem to require it, were repeated by an eminent dentist one hundred and fifty years later.

For the use of the potential cautery in cases indicating it, he gives the most minute and explicit directions for the avoidance of injury or accident.

Many of the mouth-washes and tinctures recommended seem at first glance strange and almost fantastic, but on analysis they are found to be usually in accordance with the knowledge and resources of the time, and at least are not bad.

He urges the necessity of carefully washing and drying all instruments after use, as well for cleanliness as to prevent rusting, and recommends separation of the teeth by filing for the arrest and prevention of caries, the form of these separations being the same as that advised by an eminent American dentist but little more than thirty years ago.

Fauchard practiced replantation and transplantation of teeth, and commends the practice in suitable cases, saying it is quite generally successful.

In filing teeth for shortening, the angles should be rounded and the natural shape of the tooth preserved. "In this," he says, "as in all other things, we should imitate nature as much as possible."

Thus I have endeavored to give a very brief abstract of this first systematic treatise on dentistry, in order to indicate in some degree the scope and character of Fauchard's work. This author's writings are simple and unaffected in style. His vocabulary is small, but his descriptions are accurate, and his directions for treatment and operations are careful and explicit.

Forty years after the publication of the first edition of Fauchard's book, Thomas Berdmore of London published his treatise on the "Disorders and Deformities of the Teeth and Gums." Berdmore was a skilful and educated dentist, but his book is essentially a popular treatise, and we find comparatively little of interest to the professional man, especially in regard to practical operative procedures.

He seems to ignore previous writers on the subject by saying, "The work being originally designed for artists who are not much given to reading, and for patients who do not love too much trouble, I have purposely avoided quotations. Indeed, without departing from the subject, I could only have quoted a few French authors who have written to make their names known, and one or two English who have translated very injudiciously."

This author strongly condemns replantation and transplantation of teeth, declaring that he has seen very few cases which were successful. He apparently does not question the common belief that a tooth sometimes acquires a bony union with the socket, and states that a fracture in that case is not the fault of the operator. On the subject of dental worms he is explicit, saying, "Worms of the teeth are talked of by some authors, but they do not occur in practice." "Fungus growth of the pulp," he says, "has been mistaken for worms." He recommends the actual cautery as the best means of destroying the pulp, and for subsequent dressing, oil of cloves and oil of cinnamon to be used. He urges discretion in the use of the file, declaring that nothing can be more pernicious than the filing of teeth as is usually practiced. When, however, caries is discovered on the approximal surfaces of the teeth, the file should be used freely and without loss of time.

Filling with gold or tin seems to have been regarded in his time, as in Fauchard's—an operation of minor importance.

In 1771, John Hunter's "Natural History of the Human Teeth" was published in London. Estimates of the value of Hunter's writings differ widely. He was certainly a great anatomist and surgeon, a man of wondrous power, of indomitable will, and of unflagging industry. His powers of observation and comparison amounted to genius, and his work mentioned above is an admirable treatise on the anatomy of the teeth and associate parts. He pointed out clearly the dependence of the teeth and alveolar processes upon each other. This author seems to have been the first to call attention to the fact that the "state" into which every joint most naturally falls, especially when we are asleep, is nearly in the middle between the extremes of motion. "Thence it is that commonly and naturally the teeth of the two jaws are not in contact."

He decided that the dental tissues were not vascular, as they could not be injected, nor could he trace vessels going from the pulp into the new-formed tooth. His experiments in feeding with madder were also negative. From a consideration of these and other experiments he says, "The teeth are to be considered as extraneous bodies with respect to circulation through their substance, but they most certainly have a living principle by which they are made part of the body." He regards the teeth as very different from other bones, in their development and structure. "The cavity of the tooth," he says, "contains no marrow but appears to be filled with bloodvessels, and I suppose nerves, united by a pulpy or cellular substance." He was unable, however, to trace the nerves even to the beginning of the cavity. He perpetuated the error that teeth "sometimes ankylose with the socket by bony and inflexible continuity."

In a logical manner he accounted for the necessity of the two sets of teeth, and appreciated the formation of secondary dentin by the pulp as the teeth are worn down, declaring positively that teeth do not grow continually, and explains the fallacious reasoning of those who believe to the contrary. He frankly avows that the cause of caries of the teeth is "hitherto unknown."

Hunter's experiments in the transplantation of teeth are well known, though Professor Gross was in error, as we have seen, in stating that he was the first to perform this operation, as it was not unknown to Ambroise Paré in the sixteenth century, and was also practiced by Fauchard. John Hunter was not a dentist, and operative dentistry received nothing from him.

Space will allow but little more than a bare mention of one other author whose investigations and writings on the structure and development of the teeth were of the greatest value, viz, Robert Blake—"An Essay on the Structure and Formation of the Teeth in Man and Various Animals, being Principally a Translation of his Inaugural Dissertation, Published at Edinburg, September 1798."

Nasmyth says, "He is one of the few authors who have taken the trouble to read their lesson from nature."

Two other important works must be mentioned, viz, "The Natural History of the Human Teeth," by Joseph Fox, 1803, and "The Anatomy, Physiology, and Diseases of the Teeth" by Thos. Bell, 1829.

Fox and Bell were both scholars and skilful dentists. Bell treats more fully of the procedures of operative dentistry than any author since Fauchard, and many improvements in means and methods are seen to have arisen within the hundred years. Bell's work was issued in several editions in England and in this country.

In 1839 Chapin A. Harris published "The Dental Art: A Practical Treatise on Dental Surgery," and in the same year the first dental periodical appeared, namely, the *American Journal of Dental Science*. This publication marked the beginning of a new era in modern dentistry.

PROCEEDINGS OF SOCIETIES.

NATIONAL DENTAL ASSOCIATION.

(Continued from page 332.)

SECTION II: Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

Chairman—H. E. Roberts, Philadelphia, Pa.
Secretary—C. S. Butler, Buffalo, N. Y.

The first meeting of Section II was called to order at 2.30 Tuesday afternoon, July 25th, in the Iroquois Hotel, Buffalo, N. Y., by the secretary, Dr. C. S. Butler, Buffalo, N. Y., in the absence of the chairman, Dr. H. E. Roberts, Philadelphia, Pa.

Dr. C. S. Butler, Buffalo, N. Y. Our chairman, Dr. Roberts, is absent on account of illness in his family. I have a personal letter from Dr. Roberts in which he requests me in his absence to take charge of the section, and proceed with the work as best we can.

The first paper is by Dr. J. V. Conzett of Dubuque, Iowa, on "Gold as a Filling Material."

[This paper was printed in full at page 151 of the February issue of the Cosmos.]

Discussion.

Dr. H. I. Beemer, Newton, N. J. I spent several weeks in the middle West about a year ago, and while there it was my privilege and pleasure to visit a number of members of the G. V. Black Dental Club and observe them make these operations. During my fifteen years in dentistry I have seen fillings of gold from the hands of many of our best Eastern dentists, but never have I seen such beautiful and apparently lasting operations as those which I saw done by the members of that club. Since that time I have tried to operate along those lines, and the more I try to work in that way the more it appeals to me as being the only way in which gold fillings can be made really permanent.

Dr. Butler. I want to introduce to you a very old friend of mine, Dr. W. H. Williamson of Aberdeen, Scotland, ex-president of the British Dental Association, who was my demonstrator in college more than thirty years ago. From that time to the present I have not had the privilege of seeing him, so it gives me unusual pleasure to welcome him here today, and ask him to say something in the discussion of this paper.

Dr. W. H. Williamson, Aberdeen, Scotland. I beg to thank Dr. Butler for his very kind welcome, and also to thank all of you for your very cordial greeting. I had hoped to come last year to St. Louis, as official representative of the British Dental Association, but circumstances prevented me, so I have seized the next opportunity of revisiting this country after an interval of thirty years.

Upon the occasion of my first visit I was very much impressed by the devotion to noble professional ideals that so many men of that time possessed; such, for example, as Dr. Atkinson and Dr. Marshall

Webb, who both spent time and money in doing their best for their patients and for their profession. They were imbued with a great missionary spirit, and were never weary in trying to induce others to follow the same path onward and upward in the progress of dentistry. I find now that though individuals have fallen, the race survives, and that there is still the same striving after noble ideals—the spirit that has done so much in this country to promote the advancement of our profession.

In regard to the paper just read, I am not in a position to say much, as I was unable to hear a great part of it, but I was certainly surprised to hear, at this time of day, that one could not make a gold filling with the electric mallet in which pits would not appear afterward. When I remember Dr. Webb, who built up the greatest reputation in the states as a gold filler, and who used the electric mallet entirely, I cannot understand such a statement; he certainly would never have been regarded as the premier gold filler of his time if the proof lay in the display of a lot of pitted fillings.

Advances in the science of making and manipulating plastics, together with the advent of matrix-fused porcelain, have very seriously undermined the supremacy of gold as a filling material. At any rate that is the case in Britain and it is evident that the same influences are at work here also.

Dr. E. T. Darby, Philadelphia, Pa. I did not hear the whole of Dr. Conzett's paper, but I heard enough to convince me that he, like all those who are members of the G. V. Black Dental Club, is enthusiastic upon the methods which they have accepted, and which they so well carry out in their own locality. I was wonderfully impressed last summer at the Fourth International Dental Congress at St. Louis with the work that was being done by that little coterie of men who represented the G. V. Black Dental Club. Those of you who witnessed their operations and the earnestness which attended their work must have been assured, as I was, of the great enthusiasm which had been instilled into them through some source—I will not say by whom—and which has resulted in a corps of men whose operations cannot be excelled in this or any other country. I never saw a finer series of operations than those they exhibited at that time. It is undoubtedly true that Drs. Atkinson and Webb enthused the American dentist of thirty years ago with the importance of thoroughness in preparation, and the packing and finishing of gold. We owe a great deal to Drs. Atkinson, Varney, and Webb for the fine operations that are being performed by the American dentists at the present time. Dr. Varney was probably the most artistic in his operations of any man who had lived up to that time. It is undoubtedly true that many of Dr. Varney's operations were as fine as any we see today. I knew Dr. Webb when he began the practice of dentistry; I knew the influences by which he was surrounded, and that he had the spirit of Atkinson and Varney so thoroughly instilled into his little body and brain that he could neither sleep nor rest until he had carried out his ideals in the matter of gold fillings. The operations he made twenty-five and thirty years ago are often seen today—as beautiful as could be made, I think, by anyone at that time, and possibly by anyone at this time.

In regard to the pitting of gold which has been packed by the electric mallet, I would confirm what Dr. Williamson has said. Gold can be as thoroughly packed, and when finished will be as free from pits by the use of the electric mallet, or a good mechanical mallet, as by any other means. It is undoubtedly true that many of the electric mallets in use have been improperly adjusted, and many of the mechanical mallets have not a sufficiently hard blow to thoroughly condense the gold. All things considered, perhaps the man who has not a good electric or mechanical mallet would do better to use a hand mallet and a small point with fine serrations. The matter of condensing gold is merely a matter of thoroughness, plus shallow points.

Many of us know that just as lasting

operations have been made with non-cohesive gold in simple cavities as have been made with cohesive gold. At the same time I think it would be a mistake for a man to confine himself to either. The procedure in the process Dr. Conzett has given us is undoubtedly one of the most efficient that has ever been used, namely, a combination of cohesive and non-cohesive gold. Many do not understand what is meant by non-cohesive or soft gold. I take it that Dr. Conzett does not mean gold that is absolutely non-cohesive, as I believe that there are but two manufacturers in this country who have ever made absolutely non-cohesive gold—Abbey and Morgan & Hastings.

It is not that kind of gold that the men of the Northwest use; they use a gold that possesses only a moderate degree of cohesion. In other words, it is gold that is slightly cohesive under pressure and yet sufficiently non-cohesive to admit of perfect adaptation to the walls of the cavity. They use it in the form of ropes, tape, or cylinders, and make a better adaptation with it than with cohesive foil used in the same way. To expedite the operation they use non-cohesive gold at the cervix. I do say that a man can use cohesive gold successfully, if he take the time and use it bit by bit; but he can use non-cohesive gold at the cervix, and the result will be as durable. I know of no other method by which I can save time and get more satisfactory results.

Dr. W. R. Clack, Clear Lake, Iowa. I am proud to be designated as one of those "fanatics of the Northwest," but I think if you will come and spend a little time with us, you will find that we of the West and you of the East are not so far apart. There is a difference in our terms, and a little difference in our methods, but we are both striving for the same thing—the best there is in dentistry. We are both trying to carry out what we believe to be the ideals of those old masters—those men of whom we can scarcely speak without our emotions carrying us away. I believe today that the principles taught us by Dr. Black and by his able lieutenants are some of the principles of Dr. Webb, carried on to perfection. I do not understand today that any of the principles taught by Dr. Webb are being opposed by these men, but it has been the privilege of Dr. Black to systematize and further perfect those principles.

Referring to that portion of Dr. Conzett's paper in which he speaks of the three objections to gold, I will only speak of the last—the difficulty of manipulation. I do not think that that should be regarded as an objection. I believe it is our duty to overcome those difficulties—to so train the hand of the operator and the hand of the assistant, that we may make those operations perfectly and know nothing of that difficulty.

It seems to me that a mistaken idea obtains with regard to the methods of cavity preparation advocated by Dr. Black. I will not speak on that point, as it is a separate subject; but the objection has been made that in preparing cavities for these operations we inflict more pain on the patient than in preparing the same cavities for the reception of plastic filling materials. But such is not the case, for the same principles that apply to cavity preparation for gold apply to cavity preparation for amalgam.

Speaking of the condensation of gold, and the different methods of condensing it, I do not know of any method by which the weight of the blow can be as quickly and delicately regulated as with the hand mallet. Just the movement of an eyebrow, and the blow is changed.

I saw a few months ago a statement made by some gentleman in Canada opposing the use of the mallet in gold operations or for driving the band on a tooth. on the ground that it was cruel practice. Firm hand pressure must be used if you would lessen the pain. There is in St. Paul an assistant who can strike a harder blow with the mallet than anyone I know of. I have sat in Dr. Wedelstaedt's chair for hours having a filling made at a clinic, and when he is using fifteen pounds hand pressure and the assistant is giving such a blow as she gives when he nods his head in that impatient way, the pain is very much less than if he were using an automatic plugger and no hand pressure.

In using the unannealed gold in starting the filling in the gingival third of bicuspids and molars, I think we all use the method indicated by Dr. Conzett of placing three or more cylinders of unannealed gold at the cervical margin before beginning with the annealed gold at the step. Here let me say that we use the terms "annealed" and "unannealed" gold among ourselves. It is from the same foil that the two forms of gold are made, namely, the cylinders that are placed in the gingival third, and the pellets with which the filling is finished. If we could get together a little, and understand just what we mean by the terms we use, we would have no differences. Start in the step with the annealed gold, and after anchoring it in place build out toward the axial wall, carrying it over until it becomes united with the unannealed gold in the gingival third; then go back and forth, laminating the gold, and each successive time carrying the annealed gold a little farther toward the interproximal space, because if one begins and thoroughly condenses the unannealed gold at the cavo-surface angle, one is liable to tip the gold out of the cavity. If, on the other hand, the first piece is brought over from the step into the gingivo-axial angle, either lingually or buccally, as seems best, then by condensing back and bringing over another layer it will be found that the unannealed gold is gradually condensed as the angle is being filled up, and that the annealed gold is clutching the unannealed gold and holding it in place.

I am surprised at what Dr. Williamson says of the operations in England. I have a little English blood about me myself, and I have always been taught that the Englishman when he builds does not build temporarily. My idea of England, and the desire to visit it has been that I might see those buildings that were erected by the hand of man centuries ago. They were not built with the expectation that they would tumble down within a few years and have to be rebuilt. They builded them for all time, and I am surprised that they have let down on that idea when they come to make dental operations. It is at variance with my idea of the sturdiness of the English and the steadfastness of the Scotch.

Dr. **John I. Hart**, New York, N.Y. I do not think there is such a vast difference in the theories of the Western practitioners and those of the East, although until ten or twelve years ago a difference certainly existed. About ten years ago, when Dr. Wedelstaedt visited one of the dental societies in the East, the ideas that he expressed were not well received. When Dr. Black and Dr. Wedelstaedt visited the same society at its December meeting last year they expressed views similar to those Dr. Wedelstaedt had presented some years before, and there was no great difference between the theories of those who discussed the papers and those enunciated by Dr. Black and Dr. Wedelstaedt. It merely means that the filling of teeth with gold has become a mathematical principle. The preparation of cavities and the introduction of foil has become a settled fact. We may differ in the degree of our extension on small cavities, but when it comes to the preparation of larger cavities, I do not believe there is an iota of difference between the methods practiced by the best practitioners of the West and those of the East.

As to some of the views expressed by the essayist, there is no royal road to learning or to the practice of dentistry, and we must all work hard to attain success. I think many of the failures that have been encountered with plastic gold are due to the fact that too much has been promised as to the ease with which it might be condensed. If you will work as hard with plastic gold as with foil, you will probably achieve as good results; but then the excuse for its use is eliminated, and we employ moderately heavy foil when we desire the greatest density. One thing is lost sight of when heavy blows are given. We have around the root of the tooth a pericementum, which we must preserve. With the use of mallets that deliver heavy blows we are liable to injure that membrane, and we are better off by making use of the lighter foils and small cylinders with moderate pressure than with too heavy cylinders and too great pressure. I would like to ask the essayist as to his views concerning the use of absolutely non-cohesive cylinders at the cervical border. I think we will make tighter joints by making use of absolutely non-cohesive gold at that point than by the use of semi-cohesive gold. I think the saving of teeth by the use of tin at that point is due more to the tight joint we can make than to any therapeutic value of the tin itself.

Dr. G. D. SITHERWOOD, Bloomington, Ill. I have been greatly interested in this paper, which I consider a very valuable one. I have had considerable experience in working gold. At one time I was an enthusiast in working the different forms of crystal or crystalloid gold. I do not work crystal gold at the present time; not but what a good filling can be made with it, but it requires a longer time than to make a good filling with gold foil or some of the forms of gold cylinders. I use only gold cylinders and the various forms of gold foil known as soft and cohesive gold foils. The essayist spoke of the color of gold, which we all know is frequently objectionable. I overcome that by using in the finishing of many fillings what is known as the platinized gold, shade No. 3. The surface of a filling thus finished is whiter and comes nearer to the color of the tooth.

The thermal changes I overcome by using phosphate cement—a very small quantity. It requires considerable practice and skill to use it properly. It can be used to advantage, in small quantities, to start the filling in the floor of the cavity. At one time I attempted this method and failed; but now I am successful.

As to the difficulty of manipulation, I believe I have used all forms of mallets—automatic, electric, mechanical, and the hand mallet. A good gold filling can be made by a good operator with any kind of mallet, if he understand the working of gold; but in these days time is a great consideration and consequently I believe with the essayist that frequently a good gold filling can be made in less time with the hand mallet. However, I use an automatic and hand mallet at the present time.

Much has been said about the weight of the mallet, hand pressure, and all that. Every good operator in the working of gold learns this one thing—that it requires so much pressure, whether given by the hand mallet, the automatic mallet, the electric, or whatever force one may use. It requires just so much force to condense gold. Force in excess of the maximum will result in pain to the patient and over-taxation to the operator, while an insufficient degree of force will not condense the gold. That is the one thing we must learn—how much force it takes to condense gold properly.

Another thing I have found by experience. I have some good gold fillings that look as well today as when they were first inserted twenty years ago. I used the same kind of gold I am using today, known as soft gold, which becomes cohesive upon annealing, always finishing with the gold foil folded flat. Take a half sheet of No. 4, fold it about eight times, cut it into squares, condense the gold on the surface of the filling by means of a fine serrated point mounted upon any kind of mallet, and the result will be a filling properly finished, composed of gold better condensed than by any other method I have ever tried.

Dr. F. L. FOSSUME, New York, N. Y. At a clinic before the First District Dental Society Dr. Searl filled two approximo-occlusal cavities in the upper bicuspids. When the cavities were prepared and ready for the insertion of the gold, it was announced that they might be examined by those who wished to do so. It was openly stated by some of those present that the pulps would very likely give trouble, and ultimately die. As these filling operations were made for an assistant in my office, they can be inspected at any time and easily kept track of. I know that the teeth were sensitive for some time after they had been filled, but they are now entirely normal, as I made it a point to inquire into their condition before leaving New York for this meeting. As the time required for large gold fillings has been commented on, I would say that Dr. Searl was timed during these operations, and occupied twenty-three minutes for one and twenty-six for the other; this was the time required in the packing of the gold only.

A Member. How large were the cavities?

Dr. Fossume. These cavities were prepared accurately after Dr. Black's method of extension for prevention, with anchorage in the fissures. They were large cavities. As Dr. Searl did not have the time I had the privilege of finishing one of the fillings, and found it hard and well condensed, for I burnished it using great pressure. It is a good test when a filling does not dent under the pressure of a burnisher.

The method of using an adhesive cement as a medium to anchor metal fillings, where the walls are thin and the teeth weak, was taught me in 1893 by the late Dr. J. Foster Flagg. He asked me if I knew how to anchor gold and amalgam fillings without undercuts, and when I answered in the negative, he at some length explained this method, and my experience thus far has been that it is an indispensable one.

Dr. William H. Trueman, Philadelphia, Pa. I hold very firmly that there is no one method of using gold that we are justified in saying is the best; there is no one best form of gold; there is no one best form of instrument, and no one best method of bringing the instrument and the gold together. It is all a matter of personal equation. Some like crystal gold, some like non-cohesive, some semi-cohesive, some like their gold just as cohesive and sticky as it can be made. Some like instruments with deep serrations, some like them with shallow serrations, some prefer them perfectly smooth. Some use the instruments with a pushing motion, some with a rubbing motion, and some with a circular revolving motion. With all these varied kinds of gold and instruments, and by all these varied methods of using them, good work can be done—it has been done, and can be done now.

At the present time the method most in vogue is to divide the gold in small portions and carefully weld it together, piece by piece. My preceptor was in the habit of thoroughly inspecting the cavity before taking out from his gold-foil book as much as he thought would be required to entirely fill the cavity. He would take as much as three or four sheets for a large cavity, fold and roll them into a firmly rolled cylinder, and place it in the cavity; then take a portion of a sheet of foil, make it into a firmly twisted rope, cut it into pieces one-quarter of an inch long, and pack a few of these little bits around the cylinder, finishing it with a file-cut burnisher, and in almost as little time as it takes me to tell it, the filling would be done. Sometimes he used several of such-like, but smaller, cylinders. Some will ask what kind of fillings he made. I do not pretend to answer this, but I have seen hundreds of fillings which he made that had lasted ten, fifteen, twenty, or thirty years, and had perfectly filled their purpose. What more do we want than that? It cannot be done in all cases, neither can all men do it, but it can be done, because it has been done.

Each method has its advantages and disadvantages, and it is important that we should learn them. Each method has its little tricks ready to play on the unwary. That was called to my attention when the essayist spoke of his unsuccessful results with the electric mallet. I know no more perfect instrument for compacting cohesive gold than the electric mallet, and I know of no instrument so full of tricks as is that same electric mallet. It will go humming along right merrily, and you think how beautifully it is working, yet if you stop and test with an excavator, the excavator will go right through. Then it has another beautiful trick. You start your filling and everything is working nicely; you work for an hour or two and get it full and nicely contoured, and happy are you if it should roll out before you dismiss your patient, because you can, without being able to perceive where the trouble is, make a beautiful solid filling just a trifle smaller than the cavity. I caught on to that trick very clearly in my experience with the electric mallet. To avoid it, I tack on to the filling a strip of foil projecting beyond the cavity, and closely watch it until I know that the filling is securely anchored. If this strip remains steady, I know that all is well; if it wabbles I know that it is time to stop, take all the gold out, and begin again. Notwithstanding, the electric mallet is, in my judgment, the king of gold packers if one knows how to manage it. Each method has its advantages and disadvantages; that method is best for each operator that he finds best, without reference to what others have done.

Dr. **Butler**. Inasmuch as Dr. Searl's name has been mentioned, we would like to hear from him.

Dr. A. C. **Searl**, Owatonna, Minn. The amount of gold in those fillings I am unable to tell. My assistant kept track of it, and I cannot tell you exactly. I should presume at a guess there are about four sheets of No. 4 Williams' foil in each filling.

Dr. H. B. **Tileston**, Louisville, Ky. As to the use of non-cohesive gold—we have gold that is called non-cohesive that is not so. I do not know of any gold on the market that is non-cohesive and which cannot be made cohesive by annealing, except that old gold that has been on the market over eighty years, known as Abbey's foil. Any gold which can be rendered cohesive by annealing has been rendered non-cohesive by the deposit on its surface of some volatile gas, which can be driven off by heat or may often be unintentionally rubbed off by friction. I believe it is now quite generally accepted that one of the best methods of getting adaptation to the margins is by the use of these non-cohesive cylinders, and it also saves time. I did not hear the paper, but I presume that the essayist advocated the use of three or more cylinders at the gingival margin—one on each side and one or more between. The friction of the gold, one piece upon another and upon the cavity walls, and the bruising of it with instruments, is likely to give it a cohesive surface. The operator is liable, as the key cylinder is being inserted, to have it stick at some point on the way to the wall toward which it is being carried, and to think that a close joint has been secured, when as a matter of fact it has not. With Abbey's foil, which does not become cohesive by friction, one can get it past the other gold and be certain of perfect adaptation to the cavity walls.

Dr. Clack speaks of the advantage to the peridental membrane of the mallet blow combined with hand pressure. He speaks truly when he says you cannot do that with an automatic mallet; but you can do it with the old style pneumatic mallets, with which perhaps some of you may be familiar. I think they were made after a method in vogue perhaps before I was born, with a cylinder and a plunger actuated by air pressure conveyed through a rubber tube from a bulb worked by the foot. You can combine hand pressure and vary the force of the blow just as you may desire.

Dr. C. H. **Gerrish**, Exeter, N. H. I am an Eastern man—from New Hampshire—but I have been using Abbey's foil for over forty years, and what I do not know about it is not worth knowing. That is no joke. The secret is in the man. I am more of a shooter than I am a dentist. Take two men and give each a gun with shells, and each the same kind of game, and what have you? Just what you have presented to you here. You have your patient, you have the tooth, you have the material. One man kills all the game, and the other man does not touch a feather. Follow it up all day, or the whole season. The skill of the man is a prominent factor in dental operations. I wish to speak of my experience with non-cohesive gold without the addition of cohesive foil. I shall give a clinic tomorrow, and if anyone wants to see a non-cohesive filling, I will show a countryman's way of doing things. I claim that Abbey's non-cohesive gold will save a poor tooth longer than any gold filling material that is used, and I do not care who the man is who inserts it. You have a filling that is a foil filling when it is finished. It is a cork stopper in a glass-necked bottle; but with cohesive gold, when you are through with it, you have a glass filling in a glass bottle, or rather a gold ingot that can be rolled into plate.

Dr. D. J. McMillen, Kansas City, Mo. I am from the West, and what I do not know about non-cohesive gold would make a book. I have been using soft or non-cohesive gold for thirty years, and I regard it as one of the very best golds that can be used for the saving of teeth. I have used Abbey's gold a great deal. There is another that is absolutely non-cohesive, and that is the kind put up by Morgan, Hastings & Co. A non-cohesive gold cannot be made cohesive by annealing; no difference how it be treated, so far as the dentist knows it cannot be made cohesive. If it can be, it is not fit to be used as non-cohesive gold.

In regard to using three cylinders for the purpose of filling the cervical wall of the tooth: a single cylinder rolled into a full sheet is fully as good; it adapts itself so perfectly to the walls of the tooth that it will save it for as long as I have practiced. I have seen many that have saved teeth for twenty-five years.

I could not refrain from saying a few words on the subject. I use both the mallet and hand pressure for the starting of non-cohesive gold. I fill many teeth with non-cohesive gold entirely. That is my practice. Of course an approximal cavity is not the proper place to use it, except in combination with cohesive gold. The end of a cylinder must come to the surface of a tooth, otherwise it scales in that position.

Dr. Conzett (closing the discussion). I have taken enough notes from the thoughts which the various men have expressed to lecture on all afternoon; but I am not going to do so. I shall say very little, because as the different men have arisen, they have largely answered the questions and also the objections of those who preceded them. The personal equation does enter into the filling of a tooth. All men will not be able to fill the same tooth equally as well by using the same method. One man will make a good filling with the automatic mallet; another with the hand mallet. So we have different methods in the hands of different men giving good results. But notwithstanding that, should we not have better results if we systematized our methods of operation, and all used the same methods? Would it not be well to teach the pupils in the colleges the same methods? Would we not secure better results than by all using different ones?

Some men may make good fillings with the electric mallet. Dr. Webb was unquestionably one of the best dentists that ever lived. I said I could not do it, and I was glad Dr. Trueman told me why.

Many men have attempted to make operations by following different methods. Those fillings have been tried for density and for specific gravity, and no man that has tried to make a filling with the electric mallet and had it tested by the Black Club has been able to make one above fourteen in specific gravity. There may be men here who can do it, and those who have charge of the matter would be glad to have the man who can make a filling above the density of fourteen or sixteen try it. They will send him a block and let him attempt it, and if he succeeds, they will acknowledge the fact; but thus far no one has been able to do it. They have been able to do it with the hand mallet.

Dr. Williamson spoke of the long sitting necessary for the gold operation. Other men speak of the same thing. The men who make these operations do not have their patients sit a long time. My assistant does not make an engagement for a patient for over an hour. I do not take over an hour for an operation in gold, and the rest of the members of the Wedelstaedt and Black clubs do not take any more, or much more, than that.

Dr. Hart asked me if I did not think it necessary to use absolutely non-cohesive gold. I think it is necessary to use non-cohesive gold. When we say absolutely non-cohesive gold, we mean the kind that cannot be made cohesive by annealing. I think the gold is non-cohesive as long as the film of gas remains on it. and I do not think that that film can be removed from it without annealing. I have made one or two fillings which have failed; have had several pulps die under such fillings, and have found it necessary to remove some. I am not infallible; I know that those cylinders that are placed under the cohesive gold foil are still non-cohesive. I have taken them from under a filling, and have been able to take them apart. Dr. Clack tells me that he took out a filling in which he first used the non-cohesive cylinders, and afterward the cohesive, in which the entire filling came out intact. I believe that is the exception—not the rule. I believe it necessary to have the gold at that point non-cohesive in order to adapt it to place. The layers of gold must freely pass one over the other, or there will not be perfect adaptation to the walls of the cavity.

Dr. Hart also spoke of the peridental membrane being injured. I do not think it will be by the force of the blow. I know none of my patients have ever complained of soreness after an operation. I believe that is due to the fact that the tooth is held firmly in one position. It is not allowed to wabble back and forth at every blow of the mallet. The force of the blow is felt on one part of the peridental membrane.

I do not like the idea of cement in the floor of a cavity, with the view of starting the filling with a pellet of gold malleted in the cement bed. That cement does not obtain its maximum density for from forty-eight to sixty hours, and when the gold is malleted on it immediately upon insertion it will not harden, but will remain there in a semi-powdered form. I should not do it, or recommend it.

The subject was then passed.

The next order of business was the reading of a paper by Dr. Dana W. Fellows, Portland, Maine, entitled "A Few Dental Writers of the Eighteenth Century." Dr. Fellows not being present; Dr. L. S. Chilcott, Bangor, Maine, read the paper.

[This paper is printed in full at page 422 of the present issue of the Dental Cosmos.]

Discussion.

Dr. William H. Trueman, Philadelphia, Pa. I can fully indorse all the good things Dr. Fellows has said in regard to Fauchard. He knew a great deal, and recorded much that was useful to his profession, but many things, he admits freely, he did not know. That shows he was a wise man. When a man has reached the point where he knows everything there is to know and more too, it shows he has not only matured, but is over-ripe, and is ready for a dose of Dr. Osler's chloroform.

The earlier dentists, Fauchard complains, failed to leave any record of that which they had learned, or of their operations and methods, and it was to remedy this that Fauchard wrote his book. It is indeed a standard book, and may be read with profit to this day. He did more, however, than merely write a book; he stimulated his countrymen to do what their predecessors had neglected to do, and in 1746 his example was followed by Mouton, who wrote, and wrote well, upon dental prosthesis and dental prophylaxis. Some portions of that work might today be put in English, modernized a little, read before any dental association in the land, and be taken up and discussed without suspicion of where or when it originated.

It was followed in 1754 by Lecluse, on the "Anatomy of the Mouth." Then came Bourdet's book, issued in 1757—a work in two volumes covering the whole field of dental science, sometimes spoken of as being an abridgment of Fauchard. It is, however, an original work. Then came Jourdain, 1778, with a work in two volumes on the diseases and surgical operations of the mouth and adjacent parts—the first text-book on oral surgery. In 1802, Laforgue wrote his excellent treatise, "L'Art du Dentiste." In 1803, a German edition of the same was published, and a second French edition enlarged to two volumes, in 1810. In 1805, Gariot wrote on the "Diseases and Surgery of the Mouth." Baume's work on "First Dentition" appeared in 1806. Lemaire, in 1821, translated Fox's work, and in 1822-24 published his own work on operative dentistry, dental physiology, dental pathology, in three volumes. Delabarre, in 1819, gave the profession an excellent treatise upon the second dentition, and a year later a two-volume work upon the mechanical part of the art of the surgeon-dentist. Maury, 1828, published a well-illustrated treatise upon dental art.

It is not a full list of dental works by French writers during the eighteenth century that Dr. Fellows has selected. It is the more notable ones only, and those entitled to be considered text-books that he has mentioned.

In the English language far less was done. To Dr. Fellows' list we may add Koecker's work, dated 1826, and the notable work by Dr. Samuel Sheldon Fitch, published in New York in 1829. Dr. Fitch modestly speaks of it as a compilation. It was far more, and proved so useful that a second edition was called for in 1835.

I wish to refer to several matters of professional interest associated with the century Dr. Fellows has selected. First, in regard to filling materials. Gold, lead, and tin were in use when it began. It witnessed the introduction of amalgam, brought about in this wise: Mr. W. H. Pepys of London, England, introduced the filling of carious teeth with fusible metal in 1805. While it was measurably effective, and led to the saving of many teeth that otherwise could not have been filled by the ways and means then in use, the heat required for its proper application was very objectionable. To remedy this, Regnart, a French chemist, advised the addition of mercury in 1818, and thus amalgam came into general use.

Mr. J. L. Murphy of London, England, in a work published in 1837, told how to prepare and use an amalgam of silver and mercury, stating that he had used it with much satisfaction for twelve years. He does not claim to be the discoverer, however. Who between 1818 and 1825 discarded the base metals we do not know. We know this, however, that the assertion that amalgam originated with Taveau in 1826 is an error. In his work, "Hygiene de la Bouche," fifth edition, published in Paris in 1843, Taveau speaks of a paste he has used, and which he has named "pâte d'argent" (silver paste), an amalgam of silver and mercury. This he had been using, he says, seven or eight years, and adds that it is the same that some English dentists had been using under another name. He does not claim to be its originator, and he ought to know.

The manufacture of gold foil especially prepared for dentists' use began with Mr. Marcus Bull, then of Hartford, Conn., about 1816. The first suggestion to that end came from his apprentice boy, Charles Abbey, who later became his partner, and who was the founder of the present firm of Charles Abbey & Sons. Shortly after beginning its manufacture, Mr. Bull moved to Philadelphia.

The treatment of diseased conditions of the teeth with a view to their preservation began early. Fauchard, in the first edition of his work, describes a machine for opening into the pulp-chamber of molar teeth from the occlusal surface. This is also referred to by later writers. Before the century embraced by Dr. Fellows' paper closed, the treatment of diseased conditions of the pulp and the teeth had far progressed.

Porcelain was introduced into dental practice by Duchateau, a pharmacist, about 1777; he had not sufficient influence with either the medical or dental profession to induce them to use or to recommend it. About ten years later, a physician, Nicholas Dubois de Chamant, became interested in it; he was a man of influence, and soon secured its indorsement by the medical profession, and subsequently, by persistent advertising in the public newspapers, by circulars, and in pamphlets, brought it to the notice of the dental profession and of the public. Dubois-Foucou, Fonzi, Audibran, Delabarre, Maury (not the one who wrote the text-book), and others of his countrymen, had well advanced its use before any attention was paid to it outside of France. It was introduced in America by a French dentist, Monsieur A. Plantou, who arrived in Philadelphia about 1817. It was quickly taken hold of by experimenters in different parts of the country, notably Samuel W. Stockton, a watchmaker and jeweler of Philadelphia, and Mr. McIlhenny, a dentist of the same place. By 1828, while it had not supplanted bone and ivory, its possibilities had been demontrated and its future assured.

In his work published in 1746, Mouton describes the gold shell crown for restoring broken-down teeth, and later writers refer to its use.

Ricci, a dentist practicing in Paris, wrote a pamphlet in 1816 entitled "Mémoire sur les dents raciformes ou subériques." In this he describes a method of setting crowns and bridges so as to secure a firm and cleanly attachment to the supporting roots. The roots are filled with fusible metal, the fixture heated, and quickly pressed into place. The peculiar title of this pamphlet has perhaps obscured the method it explains. Ricci's contemporaries say it required so much dexterity that but few succeeded. In these two suggestions, made so long ago, we have the basis of later-day bridge work. The suggestion of Ricci is the first method that protected the root, and secured cleanliness in root-crowning.

Dr. JOSEPH HEAD, Philadelphia. Dr. Trueman said that he thought gold foil made especially for the purpose of filling teeth, had been introduced into this country about the year 1816. I have been given the opportunity by Dr. Kirk of perusing a little book written in the German language in the fifteenth century, in which a perfect description is given of how gold foil was used at that time for filling teeth. This little work was written by a man who quoted a method—described by a physician—used, I believe, by the Arabs in the seventh century. I hardly think the method would have been so perfect and the description so complete, had there not been among those excellent workmen, the Arabs, some method of making gold foil.

Dr. TRUEMAN. The use of gold, lead, and tin for the purpose of repairing the ravages of caries in human teeth is so ancient that one might almost imagine that when Adam took Eve to a dentist to have her teeth fixed, the question was asked, Which metal shall be used?

I have a copy of the book mentioned by Dr. Head, "Zene Artzney," dated 1532. Dr. Kirk has one two years older. On the authority of an Arabian medical writer, Johannes Mesue, who flourished about the 9th cent., it is therein stated as one of the means of relieving tooth-pain that the cavity is to be scraped and cleaned with suitable instruments, and filled with gold leaf. John Arculanus is usually cited as being the first to mention the use of gold for filling teeth. I have a copy of his work, dated 1540, in which he says, in the last paragraph of chapter forty-eight, on "Pain in the Teeth," that when other means of relief fail the cavity should be filled with gold leaf. That is all. Arculanus can hardly be considered an original writer, but rather an exponent of Arabian authors whose works were then accepted text-books. These two references carry back the use of gold for this purpose at least one thousand years. Fauchard, however, was the first to describe how it should be used. He directs that the gold be rolled to various thicknesses for use in large or small cavities, and then cut into narrow strips of suitable length. These are placed endwise in the cavity, crowded aside with a wedge-shaped instrument, and then more added as long as this can be done. When no more can be added, the filling is condensed with suitable instruments, properly shaped, and polished. He preferred lead because it was softer, but he nevertheless speaks of some of his gold fillings that had done good service for twenty years. He also used tin.

I had reference, however, not to the use of gold for filling teeth, but to its manufacture especially for this purpose. This originated with Mr. Marcus Bull, at Hartford, Conn., about 1816, or perhaps a few years earlier. So far as I know, he was the first in this industry. Mr. Charles Abbey, whom I well knew, has repeatedly told me the story of how he was apprenticed about 1812 to Mr. Bull, a manufacturer of gold leaf then located at Hartford. Several dentists in the neighborhood brought to their shop from time to time johannes—or as they were commonly called, "joes"—a Portuguese coin made of very fine gold, to have them rolled out very thin for use in filling teeth. On one occasion the use of pure gold was suggested, and later some was prepared and given to a dentist for trial. It was found so far superior to the coin that Mr. Bull was urged to begin its manufacture. Mr. Abbey, who had proved quite expert, had charge of this department. As this specially prepared gold became known the demand for it increased, and Mr. Bull, about 1817, seeking a more desirable location for his business, decided to move to Philadelphia, then the metropolis of the country. All his tools and appliances were placed on board a sloop and brought to Philadelphia by water. It was not long before he made the manufacture of dentists' gold foil his sole business, and Marcus Bull's dental gold foil had a world-wide market. Mr. Abbey became his partner, later his successor, and his product was long recognized as the best to be had.

Section II then adjourned until the evening session.

First Day—*Evening Session.*

The meeting was called to order by the acting chairman, Dr. Butler.

Dr. W. R. Clack of Clear Lake, Iowa, read a paper entitled: "The Necessity for and a Method of Preserving the Integrity of the Interproximal Space." Dr. Clack also showed casts of three cases.

[This paper is printed in full at page 399 of the present issue of the Dental Cosmos.]

Discussion.

Dr. Clack. Here is a case that I wish to show, illustrating the other side. I did not make this operation; it was made at a clinic in a dental college. The filling contains one-quarter ounce of gold. I am not telling you whether I think the filling was advisable in this case, but it was most beautifully made and polished. It illustrates the lack of that condition which I deem not only proper, but imperative, if we are to have a healthy condition of gum in the interproximal space. In this case the second bicuspid was missing; there was malocclusion. It was only possible for the patient to occlude those teeth in a disto-buccal direction. I was present when this filling was made, and said to the demonstrator of operative dentistry, under whose directions the student was operating, "Doctor, should not a contact point be placed on the mesial surface of the filling in that molar?" He said, "No use for it whatever." I contend that there is always use for points of contact between the human teeth. I believe that it would have been better in this case to have protected the gum in the interproximal space; it would have prevented the further shortening of the maxilla and the crowding together of those teeth, still further destroying the occlusion.

I am moved to say a word by a clause in a letter which I received from Dr. Roberts, when he asked me to select someone to open the discussion on this paper. I had said to him, "I prefer you to appoint someone who is opposed to these methods." He wrote me back: "It will be very hard indeed to find any person who will oppose those methods, though he may utterly fail to carry out these principles in his practice." Gentlemen, I have no time for that kind of man; he is not an honest practitioner. I have every respect for a man who differs from me when he is honest in his conviction; but the man who will sit still while this matter is being discussed, and in his own practice makes operations without restoring the mesio-distal diameter of the teeth, without the contact points which will protect and restore the interproximal space, is dishonest. He lacks the courage of his convictions. I hope there is no such man in this house. I hope there are men who will stand up and tell us why they make such operations, because some of these casts are copies of operations made by men at the present moment in this room. Others were made by men who are members of this society. I want them to tell us why they do it. It is presuming a great deal more than we have a right to presume

—that we are absolutely right, and cannot be wrong, and so it is the duty of every honest man to stand up and make clear to us where we are in the wrong.

Dr. C. M. **Work**, Ottumwa, Iowa. I am not altogether in accord with what he calls the plus contact. I believe every tooth ought to be contoured, and some of them a great deal more than nature has contoured them. The plus contact sometimes is a good thing, but I do not believe it is always well to carry it as some do; neither do I think it absolutely necessary in order to secure proper contour and interproximal space.

I think the last cast is rather unfair to Dr. Clack. It does not show what he really did, and it may mislead some of you. He simply made a cast from an impression, but has not restored the interproximal space as he did in his operation. I believe as firmly in the restoration of the interproximal space, as much as I believe in the contact, or more. I think it is necessary for the comfort of the patient, for if it be not done the patient will find so much discomfort that he will wish he had not had his teeth filled. I have one case in mind where the patient said, "As soon as my dentist goes out of town, I am coming to you to have this fixed." I said, "No, do not do that; go back to him and tell him what is the matter." The dentist telephoned to me asking what was the matter, and I was able to tell him. I noticed he restored the interproximal space, and consequently the patient is comfortable today. That was three or four years ago. The filling was all right so far as the margins were concerned, but the contact point and the interproximal space were not taken into consideration in the operation at all. These things are giving more discomfort than the leaking of fillings. No one can masticate properly on a tooth—when eating meat especially—where it crowds in and gives discomfort at the gingival portion of the tooth, and it certainly will happen, if you do not have a proper contact point and the proper interproximal space. I am beginning to think those are the two most important things in dentistry. We may have restored the filling so far as extension for prevention or convenience is concerned, because nature generally compels us to do so; but how many of us succeed in restoring the interproximal space? As I said before, I am not of the opinion that one should restore it to too great an extent, although it is a matter that must be left to a man's own judgment. He must think over it and come to his own conclusion; but if he does not carry it out, he will meet with failures.

Dr. Joseph **Head**, Philadelphia, Pa. I think it is a good thing to differ with a man sometimes. I do not think anyone who has practiced dentistry will doubt for a moment the value of the interproximal space; but we must remember that Divine Providence made the teeth on a much better plan than we could possibly originate, and when we restore the teeth, if we disregard the natural lines as laid down originally, we must be very sure of our reasons for so doing.

I will take this illustration of Dr. Clack's; I would like him to tell me what harm there would have been in restoring the contour in a natural way. Why has he made these little pin-points of contact? Of course, you say, they are self-cleansing spaces. I have found that the gum underneath remains sore in some of those cases, and it is better, I think, to restore the teeth to their natural lines of contact.

Another thing: He has shown us excellent illustrations of the inflammation that results through lack of proper contour. This condition is very easily explained. There is a point of bone protruding into the interproximal space in every case of this sort. The food becomes impacted on that bone and causes the most profound soreness and discomfort. The only possible help is restoration, and I think it should be secured according to natural lines. We know perfectly well that when we extract a tooth, and the space is the width of a bicuspid, sometimes the gum is sufficiently supported by bone underneath to withstand the force of mastication, and therefore contact restoration is not required.

The principle of contour is simply the restoration of the lines of the tooth according to the original plan of nature, and whenever I do anything in dentistry, my one hope is to succeed in imitating the original idea that the Maker of things seems to have possessed.

Dr. Wm. Conrad, St. Louis, Mo. I did not hear the first part of the paper, but the subject is of sufficient importance for any dentist in active practice to be willing to discuss. In regard to treating the interproximal spaces, it is a question of the most vital importance, and one of which every conscientious dentist should make a special study. I wish to ask the essayist if in the first part of his paper he made any mention of a preliminary treatment?

Dr. Clack. I think not.

Dr. Conrad. Then I do not agree with the way he works. No one can be a good dentist, a conscientious dentist, or a successful dentist, without the true preliminary hygienic treatment of these interdental spaces, because the disease which has caused this peculiar condition is due to the impaction of food débris, and to a lack of dental hygiene. If we fill teeth without the proper preliminary treatment, there will be a recurrence of food-lodgment, and consequent disease.

I agree with his ideas, but I do not agree with his preparation for the work. Dr. Head made a very dangerous statement. I know he always does it nicely and properly, because he thinks he is right, but he is not right all the time. He refers to Divine Providence, but Divine Providence does not interfere if it is a question of the filthiness of the patient, or lack of care in the dentist.

With work of the kind such as has now been described, one cannot make a self-cleansing space that will prevent a recurrence of disease. Dr. Head speaks also about restoring the tooth to the original contour. If he would restore any of these teeth to the original contour, he would leave the space only slightly lessened. Food becomes impacted in the interproximal space, and when once that condition has been established, there will always be a tendency to recurrence. I should treat cases of this kind preliminarily with gutta-percha, packing it deeply into the cavity, and after producing a healthy condition, I would insert a wedge to protect the granulations. Next I would devitalize the teeth, crown them, and solder them together, leaving sufficient surface to protect the interproximal space forever.

Dr. E. S. Gaylord, New Haven, Conn. I feel absolutely incompetent to discuss this paper, from the very fact that when those casts were passed around I condemned every one of them. If I should say anything, it would not be in the line of discussing this paper, but in condemnation of the treatment which has been advocated tonight. In the first place we are shown conditions; what caused them? There must be a cause, and I think it is unfortunate that a man should present such beautiful work as the essayist has done and not show the antagonizing force that in my judgment has probably in all cases produced this condition. We find this condition in many mouths; we see it very frequently, and almost invariably it is caused by an abnormal occlusion. That, I believe, is the first thing to look out for and to care for—to articulate the teeth properly—and a large majority of the cases will then cure themselves without any assistance from the dentist other than that of bringing them in harmonious inter-relationship. I condemn the principle of devitalizing such teeth as shown in the first instance, viz, the two bicuspids. The devitalization of those teeth, in my judgment, was an uncalled-for procedure. If I had done such a thing, I certainly would not have inserted a gold crown, thereby defacing the mouth. I see no reason why those teeth could not be properly contoured with gold after the articulation was corrected and made as nature intended it should be. I criticize such work very severely.

Dr. G. V. Black, Chicago, Ill. I am very glad indeed to be present and to hear this discussion, and if possible to accentuate its importance. The more we study these matters, and the more we discuss them, the better will be our understanding of them. I think if there is any subject that has been misunderstood and neglected in the past, this is the one that has been neglected most. If we go back to the literature on the subject we shall find that discussion of it is more recent than perhaps some of you may think. It is not very long since the separating file was the instrument used in finishing, and many men who were accounted very good operators prided themselves on finishing fillings in that way; but I hope the separating file for such a purpose has passed out of existence forever—that it is gone from the dentist's armamentarium.

As to the particular treatment illustrated here, I think we may well have differences of opinion. It is exceedingly difficult, even with these beautiful illustrations, for us to see the case as the operator saw it with the patient in his chair. There may be reasons for this or that line of treatment in the view you get from these pictures and from the words that are spoken here, that are different from the view which the operator got in looking at the case itself. In this case [illustrating] I do not know what controlled the operator in cutting away those parts and putting on crowns.

Dr. Clack. The first bicuspid was filled; the second bicuspid was absolutely without dentin, there being none below the gingival margin.

Dr. Black. The point of criticism that struck me most favorably was the criticism as to the smallness of the contact. There are occasional cases coming before us—and this looks as though it might be one of them—where the restoration of the interproximal gum tissues seems to depend materially upon the smallness of the contact; cases where I have often bridged across with a platino-iridium wire instead of building out the filling, for the purpose of dividing the food and causing it to glide buccally and lingually, in that way constantly cleaning the space. It will do it, and those cases will get well with that small contact, whereas they would continue to hold débris, the patient not being sufficiently careful, if we made the contact of the ordinary form.

There is much in the statement that has been made here tonight, that—I will not say Providence, but that nature does not always make things right and where they are not made right it becomes our duty, after a careful study of the conditions, to try to make them so; or, if we cannot make them right, to try at least to do something that will relieve those patients, and allow them to chew their food with comfort. What are we here for? Many of those cases of restoration are restorations that if well made will serve those patients forty, fifty, sixty, or seventy years, perhaps. Our business is to conserve, and we should remember that it is a conserving that should be for a lifetime if possible. I think the criticism to the effect that the man who knows this thing and neglects it is not honest to himself, to his patients, to the community which he serves, or to his profession, was not too severe. I wish to emphasize this fact, that we have a duty that is above and beyond any money-making—a professional duty that is independent and stands above the mere matter of money-getting in our profession; but when a man has done his duty he is entitled to his pay.

Therefore I say, study this matter of the control and correction of the interproximal space—not only when you find the teeth broken down, but there are other important conditions. Measurements carefully made show conclusively that the ordinary dental apparatus when the patient has reached forty years of age, even though there has been no decay, even though they may appear never so perfect, reduces in measurement, from interproximal wear pure and simple, one centimeter from the mesial cusp of the third molar around the arch to the mesial cusp of the third molar on the other side. The arch has shortened one full centimeter, and in many cases very much more. In that shortening some particular teeth have been worn more than others, the surfaces having become flattened, and the food begins to catch.

If there be any operation that I have done for which patients seem to have been more profoundly thankful than for any other, it has been the restoration to the original form in such cases as these, so that the patient could eat comfortably. It is one of the things that has been continuously neglected. The patient complains of this space catching and holding food year after year. Finally, decay begins near the gingival line where fermentation has occurred, or else disease of the peridental membrane has resulted from that continual crowding of food, and the patient is in a fair way to lose those teeth, and perhaps does lose them prematurely—a neglect in duty to those patients. If we will study that fact with the clear conviction of our professional duty, we are going to save many a patient much misery, and do that which will redound to our credit as a profession.

Dr. J. Y. Crawford, Nashville, Tenn. I did not hear the paper, but some very interesting thoughts have been brought out. If I am capable of judging from the exhibits on the wall, they represent a wide range of trouble for our patients. As to the manner of treating these vicious spaces, I think one of the important points is to first designate the class under which they come, together with the peculiarities of the patient—age, sex, etc., and the manner of living.

Dr. Clack. Allow me to make a statement here that will throw some light on this matter. I surely thought that any dentist looking at these illustrations would see that that is not the first molar. Look at the disto-lingual cusp there [illustrating]. It is the second molar. The first molar was lost before I saw the patient. In each of those cases this tooth was extracted, and the teeth have partly closed the space, so it was not a question with me of bringing these teeth back. The tooth was absolutely missing, and for want of proper contact the second bicuspid was driven from its proper place, and there was no way of preventing it from still further drifting but by making these contact points.

Dr. Crawford. The gentleman's remarks simply accentuate what I expected to say. We find one class designated as acquired cases. You may have congenital cases; you may have such a manifestation as the result of a pathological condition. I do think it is all-important to determine what is the cause, in a general sense, which has destroyed the space you are trying to restore and, at least partially, the teeth you are trying to render comfortable. I am inclined to the opinion that many of these cases could be treated by utilizing the inlays or attachments to the teeth, by tying them together, thus supplementing the deficiency of contact and making them serviceable. I am satisfied that in many cases this would be the most effective way.

After the meridian of life, as Dr. Black mentioned, there is a tendency for the original oval or round contact point to become a smooth-worn facet upon the two approximal surfaces. Every careful observer knows that at that time of life as a rule—there are always exceptions—there is a marked tendency for the teeth to move apart, a condition which necessitates a very ingenious operation to swell or enlarge the contact point. I am inclined to think that in many of those cases a better plan would be to insert inlays which, by soldering them together, would afford an interproximal space readily cleanable, if the expression be permissible.

Those cases of tooth-migration I have marked in my mind as the result of pathological changes between the teeth. The gum tentacle acts often as a wedge, pushing the tooth back and setting up an inflammation leading to suppuration, and nature instead of building granulations builds a pocket on the side of the tooth, and when that subsides a hard growth will have been formed. I have sought a long time to impress upon the profession the propriety of attending to these spaces. In full mouths with thirty-two teeth, all of you who have been careful observers have seen spacing and migration of the teeth, the result of so-called pyorrhea pockets being formed between the teeth. Many of these, however, are not pyorrhea pockets at all. I know that pyorrhea is the ordinary definition for pus exuding from the gum, but in a case in which a trauma is paramount in maintaining the trouble, the condition is not, strictly speaking, pyorrhea; it is simply a condition that is often amenable to one treatment, that consisting in scaling the teeth thoroughly and in tying them together.

The maintenance in a normal condition of the interproximal space has been to me of paramount importance in all my professional life. I have insisted upon endeavoring to maintain it, and I never hear this subject without thinking of Webb, who always restored the space to what it had been before its mutilation by the carious process.

Dr. Conrad. One of the speakers has referred to the fact that he would not devitalize and crown. The point that is of paramount importance is to devitalize some of these teeth in order to assist in the cure where the peridental membrane has become involved. Some cases could never be cured without devitalizing.

Dr. Clack. The first question asked was, "Are the contact points of hard or soft gold?" Always—*always*—ALWAYS hard gold! Unannealed gold in that case will not do for small contact points. If it were admissible to make contact *surfaces* that kind of gold might do; but you cannot make contact surfaces and have the condition that I wish to produce there, and that I have produced. If you have big contact surfaces you cannot have the perfect embrasures on the buccal and lingual surfaces of the fillings. Always make the contact points of annealed gold.

A speaker said—and his criticism was proper—that I should have shown the casts of each case in occlusion. I have here the original cast of this lady's teeth just after the operations were made, and it will show that these contact points were very small. I doubt if any are larger than the lead in the point of an ordinary pencil. I had two original casts of occlusion at a meeting; one of them was accidentally dropped and broken, and the other disappeared. That is why I am here without them, and why I cannot allow the other original casts to be taken from the table. The occlusion of all the other cases is here on the table, and may be examined. What appears to you to be a solid mass there at the contact point and seems to be a large contact is in fact a small contact; but the gum has cuddled down so well that it seems to be a solid mass. I assure you that that gum tissue is hard and firm, and I believe that no recurrence of decay will ever take place under that healthy gum tissue Those lines were all extended to the gingival margin. The gum tissue is as hard and firm today as any I ever saw.

In this case [illustrating] it has been asked if the gum was sore. It was. That was the reason the patient came to me, coming from another town because someone had told her that that difficulty could be cured. The lower teeth are all present. The food was crowding into that space every time she attempted to eat.

I think Dr. Head's criticism is somewhat answered when I state to you that this first molar was missing; simply restoring the original condition there would not have sufficed. I was obliged to plus contour, and the smallness of the contact makes that seem more apparent. When I first began to make these contacts I used to make them fairly large; I thought they had to be large to be good, and I did not find gum tissue coming in so perfectly. There would be a little irritation present. After listening to Dr. Black again, I called in some of those patients, and reduced the diameter of the contact points; it was only a short time before I had healthy tissue. I know it is open to the objection that a cantilever is there being set up. But look at the lower bicuspids. If the Almighty does that right along, often making the mesio-distal diameter of the lower bicuspids—how much exceeding the root at the gingival line, Dr. Black?

Dr. Black. More than double.

Dr. Clack. Then I believe we are justified in so doing. The mere fact that my friend Dr. Conrad asserts that this condition will not remain as it now is does not prove anything.

I was not responsible for the loss of the teeth in those cases. I do not extract teeth; it is seldom done in my office, but we have a man in our town—not a dentist who advertises: "Dr —— extracts teeth without pain," and each one of these cases is a mark of the beast.

As to the criticism that this gold crown defaces the boy's face, I cannot make a porcelain crown that will withstand the masticating stress of that boy when he is eating some of the tough beef we have in our country. He has long lips. This [illustrating] is the second bicuspid. The probability is he will wear a mustache, and I do not think any young lady will ever find out he has a gold crown there, "defacing his face," unless he shows it to her.

I did not devitalize these teeth, although I used to perform such operations. I devitalized many a tooth—and the alveolar process surrounding it. I do not consider a pulpless tooth a devitalized tooth. I consider it always better practice to remove the pulp from any tooth where I am firmly convinced I will have after-trouble, than to soothe it for the time being, only to have the patient come back afterward, and be compelled to bore through one of those crowns and remove a putrescent pulp. I remove pulps, not "nerves," and do not devitalize teeth.

My folks at home have quite a laugh on Dad. I had been working on this paper during the winter, and had been working at the chair several hours a day making these restorations. Some time in March I was taken sick, and had quite a high fever. Sickness always going to the weakest place, my brain was affected, and one night, talking in my delirium, I was trying to make three contact points on a filling in the mesial surface of a molar, and make them all in the right place; so now they say at home, "Dad has 'contact' on the brain." I hope the day will come when every practitioner will have sufficient "contact on the brain" to make contact points on the fillings and crowns he makes for his patients. (Applause.)

I learned something from the last paper we had read in Section II this afternoon—the one by Dr. Fellows, entitled "A Few Dental Writers of the Eighteenth Century." Dr. Black brought this particularly to my mind when he spoke of the separating files. In my old preceptor's office in Milwaukee were several of those instruments, each of which had a great curl on them for going back of the lips and cheek for getting spaces; self-cleansing spaces they called them. I have often wondered where they came from; I found today that in the researches of the gentleman who wrote that paper, he found an authority for this method two and one-half centuries ago—the filing apart of the teeth.

Is it not time that we abandoned some of those "good old practices," and make our operations after twentieth century methods?

A patient came to my office last Friday who lives not a hundred miles from Buffalo. In re-setting a porcelain inlay for her, I noticed that there was absolutely no contact. I took my large pliers and held the porcelain inlay in the mesial surface of the upper left first bicuspid by passing it between what should have been a contact point on a gold filling in the canine and the inlay. I noticed a diseased condition there, and one on the other side, and also one on the lower right side. I said: "Did you never have contact made between those fillings?" She said: "No; my dentist says it is not best for me to have contact in my teeth; that I must have spaces wide enough to remove the food that crowds in there." Her dentist is twenty-seven years old; he must have been taught that within a few years. I know there are men here who are instructors all over the land, but I sincerely hope that the day has passed when a man will stand before a class of boys and advocate the making of crowns and fillings without making firm contact.

Now, I am a pretty heavy man; suppose I run against the first man that stands over there. If he is standing separate from the rest he must be a very solid man if I cannot move him off his feet; but if he is standing in firm contact with a line that is sixteen deep, what will be the effect? I shall not move him very far. I believe it is the same with the teeth.

Speaking of central incisors separating, I never saw the centrals in the mouth of an adult separate, and remain that way, unless there was a strong occlusion with the lower incisors. While you may hold the teeth there with your staple for a time, if you will restore or increase the mesio-distal diameter of the upper teeth so that the teeth do not occlude, you will have no further trouble. (See paper of Dr. E. A. Bogue, published in the June 1905 issue of the DENTAL COSMOS, page 696.)

I thank you for the extended discussion, especially those who have opposed the methods, because I have gained something from that which I shall try to reduce to practice.

The subject was passed.

Dr. JOSEPH HEAD, Philadelphia, Pa., then read a paper entitled "The Strength of Porcelain When Used as a Tip or Corner."

[This paper was printed in full at page 130 of the February issue of the DENTAL COSMOS.]

Discussion.

Dr. L. E. CUSTER, Dayton, Ohio. I would like to ask Dr. Head about how many of these tests were made?

Dr. HEAD. About one hundred or one hundred and fifty altogether.

Dr. CUSTER. Dr. Head is always so scientific in what he has to offer that it is difficult for one in opening the discussion to differ from him in the least; yet I feel there are one or two points that might bear consideration. There are several factors that enter into the problem which Dr. Head has discussed. One is the mixing of the porcelain itself, getting the exact amount within a certain space with regard to outside measurement. Another is the baking of this porcelain. It is not possible to bake porcelain always in the same way so as to obtain the same results regarding both the crushing and the breaking stress. Different degrees of heat to which we subject the same porcelain—agreeing that it has all been compressed alike—will have much to do with the strength of the finished article. So that factor would enter somewhat in the table he has presented; and yet the number of experiments made is sufficient to cover the ground, and produce a fairly satisfactory result.

It is true that the position in which these were held are not as you would find them in practice, and yet the test must show to everyone the points which Dr. Head wished to bring out; namely, the breaking stress of a porcelain filling which had been sufficiently anchored within the tooth, and that in a contour filling the point of breakage is not through the filling itself, but along the line of union between it and the tooth-enamel—the point where the cement has been gradually washed out and the support lost.

While a porcelain filling may break under very slight pressure, this is due largely to the smallness of the point of contact. Enlarge the point of contact, and I will venture the opinion that in proportion as one increases the actual amount of surface in contact, the amount of pressure will be raised. The greater the surface in contact the greater the stress the porcelain will stand before it begins to crush.

Dr. G. V. BLACK, Chicago, Ill. I think I will allude to but one point to express my interest in this line of work. It is in the right direction. We need a great deal more of exact experimenting along all these lines; it will bring us abundant fruit after a while. We may not see it at once, but it is leading in the direction that will develop and do us good. Particularly I wanted to allude to his experiments with blows, because his operation with the rubber bands must be regarded as blows. The world has not yet learned how to calculate the stress of blows. Physicists know nothing about it. An effort has been made only at some speculative reasoning on this point. There is a way to come at it, although we cannot yet do so with algebraic equations. We can construct an instrument which in connection with a dynamometer will give us the exact force of the blow. When I say that, I mean the pounds' stress between the mallet and the table when I strike it; not how far I might knock some substance having a certain weight. The rubber that he fastens that filling in with is equivalent to the gunny-sack of shavings that the drayman threw on the sidewalk to break the blow before he threw his box off.

Now, we may by a small machine in which we have control of the weight, which we let fall a definite distance in a direct line, determine the depth that an instrument point of a certain diameter will be driven into this or that metallic substance, and may repeat that effect with a dynamometer, and by measuring the depth and finding them equal get at it exactly in number of pounds. When you have arrived at that you will be very much surprised at the number of pounds a very small weight will give. While the ounces which the essayist has given this evening seemed very small, I take it that when he gets at the actual force of his blow he will find it was not small, and that the porcelain stood an equal stress with the one method of using force that it did with the other.

A three-ounce weight falling three feet striking upon an anvil will give a stress of nearly six hundred pounds. That is a matter of actual measurement. We don't want our toes under it!

Dr. J. Q. BYRAM, Indianapolis, Ind. I am very much interested in this subject, and have done some experimental work along this line in trying to test the comparative strength of several porcelain bodies. I have not gone so far as to make a comparison between different high-fusing porcelains, but have confined my tests to the difference between the low-fusing and the high-fusing. My tests have been conducted along different lines. I have found that when it comes to a direct crushing stress, the low-fusing porcelain is the strongest; but in any case where a tensile strength is applied, the high-fusing is much the stronger. This is a point which we must bear in mind. With many of our inlays we have only a crushing stress, while in many others, especially with crowns for bicuspids, we have a tensile strain, because of the interlocking of the cusps which makes a series of inclined planes.

If I may digress slightly a moment—because Dr. Head mentioned something about it—I wish to say that I am an enthusiastic porcelain worker. I am sufficiently enthusiastic to allow Dr. Head to remove two gold fillings that were inserted twenty-one years ago, yet I am not enthusiastic enough to use porcelain extensively for bicuspids and molars. When we consider that it is a friable material, and that it has but little tensile strength, we cannot hope to produce a lasting filling with it in those restorations where we must of necessity have a number of frail margins. Therefore, rather than be called upon to repair porcelain fillings, such as will occur if we insert them in these cases, I believe we should avail ourselves of the gold inlay or gold filling. I assure those who are interested in this matter that you will find these experiments in many respects rather discouraging. We thought a few years ago that all we needed was to make an inlay and cement it in position, and the cement would reinforce it in such a manner that it would have the strength of the natural tooth. But we were sorely disappointed.

I want to back Dr. Head in the statement that one may use porcelain of any variety. The primary thing is to use the porcelain that in the experience of the operator is productive of the best results. I think that they are all about equally strong for practical purposes.

Dr. HEAD (closing the discussion). I agree with what Dr. Custer has said, that this is a subject fraught with much difficulty. I feel that the work I have done is only started, and must be continued; but I brought it here in order that those who were in sympathy with it might work with me along these lines. I feel, as Dr. Black said, that the snap of the rubber bands is a great deal more powerful than is generally supposed. It did not occur to me until he spoke that the mere fact that a seven- or eight-ounce blow would break porcelain, when it would stand up to twenty-eight pounds steady pressure, of itself proved that an eight-ounce blow through a quarter of an inch is equivalent to from twenty to twenty-eight pounds of steady pressure. But then everything Dr. Black says is suggestive, and this subject can be worked out further.

I would say in reference to Dr. Byram's question as to how many of my fillings had to be replaced on the grinding surface, that I knew this subject would come up, and I thought I would look over my patients to give a fair idea of how many fillings I had to repair; I found it to be about five per cent.

When edges that have been caught by opposing bicuspids or molars chip, they chip usually on the grinding surfaces, and are inconspicuous from the outside of the mouth. If they are cut out and filled with gold, they are practically permanent and we never, or hardly ever, have any recurrence of the chipping.

The subject was passed, and the section adjourned until Wednesday afternoon.

SECOND DAY—*Afternoon Session.*

Dr. Butler introduced Dr. I. J. WETHERBEE, Boston, Mass., who read a paper entitled "Tin and Gold: Its Possibilities and Uses as a Filling Material."

[This paper was also read at the annual meeting of the Massachusetts Dental Society, as printed at page 60 of the January issue of the COSMOS.]

Discussion.

Dr. H. L. AMBLER, Cleveland, Ohio. For at least forty years I have been interested in the subject of filling teeth with tin, and with tin and gold—that is, filling the cervical third of the cavity with tin, and the remainder with cohesive gold,—or a combination of tin and gold folded together in alternate layers.

As I understood Dr. Wetherbee's method, it consists in lining the cavity, after it is prepared for filling, with a mat of five or six thicknesses of No. 4 or 5 non-cohesive gold, held in position with an instrument while the tin foil is introduced by hand or mallet force. After the cavity is nearly full, the tin is covered with cohesive gold. That operation is a good one and I am in favor of it. This method of lining cavities with gold, in cases where the labial or buccal walls are thin, and where the tin might possibly oxidize a little and show through, is not a new operation. If you refer to a book entitled, "Tin Foil and its Combinations for Filling Teeth," which is used as a text-book in some of the colleges, on page 55 you will find this method recorded; some of the fillings lasted for thirty-seven years. There is a gentleman in this room, Dr. Corydon Palmer, who made such operations a great while ago.

Dr. CORYDON PALMER. It was in 1839.

Dr. AMBLER. Sixty-six years ago! I simply wish to call your attention to the fact that it was a method with which the older men were familiar, but in which many of the younger ones have not received instruction. This method was used in the incisors and canines, as well as in bicuspids and molars, and has proved a success.

Wherever gold and tin are used in a cavity, part of the cavity being filled with tin and part with gold, and both the metals exposed to the fluids of the mouth, an electric battery is established.

The tin becoming the positive element, and the gold the negative, an electrolytic action will be set up, some particles of the tin becoming connected with the gold. This action joins the two masses—gold and tin. After the tin becomes discolored the electrolytic action ceases, and if you ever have an opportunity, as I have had, of obtaining a filling that has been worn in the mouth for some time, where the cervical third was filled with tin, and the remainder with gold, lay it on your bench, then take a chisel and put it at the junction of the tin and gold; strike it with a mallet and see if you can separate them; you will find that it is impossible to separate them exactly at the line of junction. Of course, this firm union of the tin and gold assists in retaining the filling in the cavity, but if you fill teeth in that way, you should not depend entirely upon this electrolytic action between the two metals for holding the filling in the tooth. The rest of the cavity should be of good retaining form.

This method, of filling the cervical third of the cavity with tin and the remainder with gold has been known since 1880, and it may have been used before that time. On page 57 of the same book you will find this fact recorded.

The other method of filling teeth with tin and gold is to take an equal amount of it in sheets of whatever thickness one may wish, and fold it together into tapes, keeping the gold on the outside when a tooth of first-class structure is to be filled, and the tin on the outside when the tooth to be filled is of poor structure. After folding the end of the tape two or three times on itself, insert it in the cavity, fixing it by hand pressure; then fold the tape back and forth, and mallet it with the automatic mallet or the hand mallet. Mallet it layer by layer, and condense it thoroughly, exactly in the same manner as when building up a filling with cohesive gold.

On page 98 of the book before mentioned, you will find that Dr. J. S. Clark of New Orleans, in 1851 made cylinders of tin and gold in alternate layers, and filled teeth with them. Such is the history of that method of equal parts of tin and gold.

The reason for keeping the tin on the outside of these tapes when a tooth of poor structure is to be filled is this: the tin is easily adapted to such a tooth and makes a tight margin. There is some electrolytic action between the tin and the gold. It oxidizes a little, and this oxid fills up to a slight extent the ends of the tubuli of teeth of this poor kind of structure; a tight filling will result, which would not have been possible with cohesive gold and the mallet.

The method Dr. Wetherbee spoke of—filling with ivory points or pluggers—was introduced by Dr. Shumway. In 1881, Dr. Shumway patented five instruments made of ivory, which he is using entirely for all operations with gold and tin. I had no faith in these instruments until I tried them, and found in their use the easiest way a tooth could possibly be filled with tin or gold foil. Not many of them have been sold, because they are easily damaged, either the points or the corners breaking off entirely. They cost three dollars each, and have never been sold very extensively. With a little experience excellent operations can be made with them. I have given some clinics in the West, to demonstrate these instruments.

There is great benefit accruing from filling teeth with the proper kind of tin foil, because we know that gold as compared with tin is six times as good a conductor of heat, and four times as good a conductor of electricity. This is a large factor in favor of the tin foil, because intense thermal changes will not be carried through the sensitive part of the tooth, and thence to the pulp. Tin foil can be placed nearer a pulp than gold, without impairing its vitality.

It is a fact that recalcification of the dentin occurs under tin fillings. Teeth extracted twenty or thirty years after the insertion of tin fillings have demonstrated that a re-deposition of inorganic materials had taken place. The dentin is hard and of a light brown color. One of our microscopists to whom I submitted specimens says that there is no doubt such a condition existed, and designated it as progressive calcification under the tin filling.

Dr. Chase of St. Louis, and others, used tin forty years ago. In sensitive cavities where they could not obtain sufficient anchorage for gold, they would endeavor to secure a small anchorage, and would then fill with tin. When the tin foil wore out or was removed, they were able to excavate and to fill with cohesive gold, because the cavities were then not so sensitive as formerly.

One thing that has militated against the use of tin foil is the fact that many varieties of it are on the market which are unfit for filling teeth, for many reasons. Of course, as with everything else, some are good and some are poor. With the proper kind of tin foil which can be obtained now, and with the same mallet and instruments as used for filling with cohesive gold, a solid tin filling can be made, beginning at the floor of any cavity in any tooth, and building up the tin foil in successive layers and malleting each layer thoroughly. You can lay the mass on an anvil, flatten it out to a reasonable degree, and it will not come apart. It is almost like a piece of solid tin. I have a lateral incisor in my own mouth that was filled twice in the last twenty-five years with cohesive gold. Both fillings failed. Thirteen years ago I had the cervical third filled with tin and the rest with gold, and that filling is in place now.

I have also a lower left lateral incisor which was filled about ten years ago. That had also been filled twice with gold, and both fillings failed, and I then had the cervical third of that one filled with tin and the rest with gold. The tin in this case is carried up along the lingual side. The canine laps over on the lateral and you know what that means. I have a disto-occlusal cavity in a molar filled with tin in the cervical third, and the remainder with gold; that is likewise in good condition after many years of service.

I looked over the program, and saw that this subject was to be brought up, so I thought I would bring two specimens. One is a third molar that is filled entirely with tin foil. The tin foil they had thirty years ago would wear out easily in some locations, but the best tin foil today is cohesive under hand or mallet force, as it can be malleted down hard, and it will wear two or three times as long as the old kind. This third molar was in the mouth for thirty years, and it has three tin fillings. The patient was old at the end of that time, and the tooth was extracted together with others in preparing the mouth for an artificial set.

The other specimen is an upper molar tooth with a mesio-occlusal and a disto-occlusal cavity. In the cervical third of each cavity tin foil has been used, and in the remaining two-thirds, cohesive gold. That was worn in the mouth for eighteen years, when again for prosthetic reasons the tooth was extracted along with others.

Dr. S. C. G. Watkins, Montclair, N. J. The subject of tin and gold is one I have been considerably interested in for a long time. I cannot go back with tin and gold as far as Dr. Ambler has; but I can go back to about 1881. It has been my practice at different times, in using tin and gold, to partly fill the cavity with tin. There was one thing especially I have learned from experience, viz, if the cavity be partly filled, say one-quarter, with tin and then completed with gold—if the filling be examined in the course of a few years, one will look in vain for the tin; it will all be gone. You have an oxid above the gold, but no tin—not a sign of it; the tin will have completely disappeared, and there will be nothing but a soft tin oxid left. But if you fill the cavity at least one-third, one-half, or two-thirds full of tin, then you will have a perfect filling.

The chemical action is such that the tin will harden and thus improve, where otherwise it would deteriorate. This is a point worth remembering in using the two metals. Use plenty of tin, if you use it at all.

Another point to be remembered is that tin is a very poor conductor of temperature, and in many cases it is advisable and good practice to partly fill an extremely sensitive tooth with tin. I have used it where the pulp was almost exposed, and exceedingly sensitive; I half filled the cavity with tin, and then with amalgam or gold, and there would be no thermal trouble—no pain whatever; whereas if it had been filled with any of the other metals, there would have been great suffering from changes of temperature.

The lining of the cavity with gold before the tin is inserted, is something I have practiced for a long time, and it is an excellent thing to do; otherwise the oxidation will discolor the tooth to such an extent that it will be unsightly—the gold will largely prevent that.

Where the gold and tin are rolled or folded together, less discoloration will be noticeable through the tooth. Old Dr. Lord of New York, during his lifetime used that method very largely, and he felt that such was the true way to use gold and tin. I have not used this as much as the other method. I have felt many times that I would use it more often, but you know how one gets into ruts, and will practice the method to which he is accustomed in preference to others. I really believe that the rolled or folded method would be preferable.

Dr. F. W. Stiff, Richmond, Va. I gave a clinic today on the use of what is mainly tin, I presume. It is a preparation made by Ivory—his "crystal alloy." I have been using it since the Asheville meeting, with pleasure to myself and comfort to the patient. The adaptability is better than gold, and the nonconductivity is superior as compared with gold or amalgam. I find I can place it much nearer the pulp than gold or any other permanent material. I have had no experience with the use of tin in conjunction with gold in the folded form, so I cannot speak on that point.

I am much pleased with the use of tin as prepared by Ivory, as it is shredded. I do not know whether it is entirely composed of tin, but it must be mainly so. It is adapted as easily as DeTrey's or Watt's gold. In the operation today, the cavity was partly filled with this preparation and the rest with Watt's gold. I was pleased to hear the commendation of tin and gold by the gentlemen who have spoken on the subject.

Dr. Burton Lee Thorpe, St. Louis, Mo. I want to add a word of indorsement regarding Dr. Stiff's remarks. Ever since the death of Dr. Jerry Robinson of Detroit, the man who put on the market fibrous tin, there has never been so near an approach to an ideal preparation of tin as Ivory's. It is easily adapted to the cavity walls, is a nonconductor of thermal shocks, and is a very good preparation for lining deep-seated cavities in vital teeth. Gold malleted on it forms an absolute and perfect adhesion. To my mind it is one of the best pulp-protectors. Its only objection, that I have discovered, is that in using it on damp days in combination with annealed gold, an electrolytic action is produced when the gold, carried on a steel instrument, comes in contact with this fibrous alloy.

The therapeutical value of tin as a filling material is inestimable. Probably the best tin foil at the command of the profession today is Ambler's "cohesive tin foil." This I have experimented with in my practice and at my college clinic, and find that its ease of adaptation and non-conducting properties make it an ideal filling material especially adapted for children's teeth.

Dr. Corydon Palmer, Warren, Ohio. I am personally opposed to the use of a combination of filling materials in the same cavity. I like a clean thing, a clean filling made entirely of pure tin or gold.

I was quite young when I began. I made my own instruments. My judgment and ingenuity guided me. I obtained some gold from Charles Abbey, in Philadelphia, who was then the notable foil-maker. Excuse me for branching on to gold, but it is connected with what I want to say. The gold made by Charles Abbey was of a dark tone or color and was good as long as one used it with hand force. We had a tin foil made by Charles Abbey that was called chemically pure tin. I had some of it, and I saw a filling made of it; but I did not like it because it was of a dark color, and when the teeth were filled with it it cast a dark shadow between them.

I want to tell you that anything mixed with the tin does not make a good foil. Any preparation of gold that is made by precipitating it and making it into sponge gold, and all these different forms of gold, does not make a good filling. If you want a good metal that will be fine, tough, and brilliant, it must go under the roller and that puts life into it.

If you want a good tin foil you must have the best quality of tin that can be procured, and it must be made by beating it, which toughens it but without corrugating it. Have the foil clean, and a nice metallic surface will be the result.

My dear friend, Dr. Ambler, has gone over everything concerning tin. There is an advance in the use of tin. He knows a way of using it so as to render it cohesive. Since my time of using it he has found that out, and a filling thus made will be harder, and will stand more wear than one made according to the old method. The old way was to make it into cylinders, either by folding it into a rope or by twisting it. Speaking of Dr. S. C. Clark of New Orleans, he was the first man who ever proposed the use of metallic cylinders for filling teeth.

When I first began practicing I found out that if very sensitive cavities are filled with gold they will hurt to such an extent that eventually the pain becomes unbearable, and that if they are filled with tin they will remain comfortable.

One is a greater thermal conductor than the other, and the exposed living surface cannot bear it.

I wish you might know what a nice clean tin foil is, that has not been handled. That makes me think of what I saw today, and at other meetings. Men will take a sheet of foil and crumple it all up in their hands, push it up, and wind it around an instrument and then stuff that into a tooth. If they just would take that and hold it in the flame of a spirit lamp and see the white smoke come off it, they will then know what they are doing. You must not put anything into a tooth that you handle with your hands; some people's hands perspire more than others. It is not a nice thing to do. Keep it away from the atmosphere and do not handle it.

Dr. W. G. Ebersole, Cleveland, Ohio. The only side of the question I wish to speak on besides indorsing Dr. Ambler and Dr. Palmer, is that from the humanitarian side. I come from a section of the country where I have witnessed the work of some of the men who have talked to you this afternoon. I know what tin will do. No one has said it would save teeth better than any other filling, but those of you who are accustomed to watch the workings of tin know that it is very rare to see any recurrence of decay underneath a tin filling. This you cannot say of any other metallic filling.

Dr. Watkins brought out a very important side of the question—the ability to place this filling material close to the pulp without afterward producing any disturbance from thermal changes. When he spoke of filling the cavity one-quarter full of tin, and the trouble that had followed, I thought he was going to be an anti-tin man; but I was gratified to hear him say we should use at least one-third tin. In the Cosmos for November 1905 appeared a paper from one of the men from the Northwest, condemning tin. I am going to say to you that that man, and the men who take the stand he takes, do not understand or know how to use tin.

Dr. M. Albrecht, Indianapolis, Ind. I did not hear the essay, but I heard something of the discussion about tin and gold, about filling part of the cavity with tin and finishing with gold. You have used the word "conductivity." Am I to infer that the combination of tin and gold is a non-conductor of thermal influences? If that be the case, I feel I have a better method to suggest, which I have been using for years, and it is strange to me that any observing practitioner should not have mentioned it before. It consists in filling large, deep cavities partly with cement, leaving a sufficiently large portion of them unfilled, in order to finish the operation with metallic foil properly and securely anchored in the cement-based cavity.

Tin foil is not as good a protector as cement. Gutta-percha does not make a good foundation. It is like building on a sand foundation. You have not convinced me of the utility of your combination, I must confess. The characteristics of tin and gold are different, and what may be gained from the combination I do not understand, unless it be cheapness. Anyone who claims that the combination of tin and gold will make a superior filling, is laboring under an hallucination. We have seen gold fillings that have lasted ten, twenty, and thirty years, and even longer. Tin fillings have lasted years, but in what way the combination of the two metals is helpful I fail to see or understand.

Dr. WETHERBEE. It has been a great pleasure to hear so many remarks made favorable to tin. I cannot help experiencing a feeling of mild surprise that there have not been more dissenting opinions, especially in view of some rather bitter attacks made on the use of tin during the past year.

Dr. Ambler's theory of electrolysis by which he explains the wonderful strength at the point of union of the two metals, seems most plausible.

The method which I employ in combining tin and gold is known as the Shumway method; malleting at any stage of the operation is excluded, for the reason that the tin can be as thoroughly condensed by heated plugger points, and to mallet gold on a foundation of tin (as it is used in this method) would cause disturbance of the tin owing to the difference in density between tin and gold.

The section then adjourned until Thursday afternoon.

THIRD DAY—*Afternoon Session.*

The meeting was called to order by the secretary, Dr. Butler. Dr. M. F. Finley, Washington, D. C., was invited to occupy the chair, while Dr. Butler read the paper of Dr. CHARLES MILTON FORD, entitled "General Dental Education."

The subject was passed.

Dr. D. O. M. LECRON, St. Louis, then read a paper entitled, "A Few Experiments in Porcelain."

[This paper is printed in full at page 406 of the present issue of the COSMOS.]

Discussion.

Dr. L. E. CUSTER, Dayton, Ohio. This is a subject which is quite in place at this stage of the progress and extensive use of porcelain for inlay and crown work. The second part of the paper spoke of the determination of the fusing-point of porcelain—a very essential thing. We have realized the great difficulty of judging correctly the degree of heat in the high temperature which we are using, and which is necessary in the fusing of porcelain. There have been a great variety of devices placed before the profession. Six or eight were described by me some ten years ago, when I introduced the electric oven. They did not attract very much attention on account of the importance of the electric oven itself, and the profession seemed to have lost sight of these advantages. There are now a number of different devices for the determination of the high heat; that proposed by Dr. LeCron seems to be the most reliable, except that it may be aided a little by a strong light thrown in the furnace to facilitate the observation of the nugget. It may be obtained by an arc light or the use of the Nernst glower. It will throw a different colored light upon the porcelain which is being fused. If the glower is placed in the top of the oven, as with the Welsbach mantle, we do not have greater heat, but a greater light. So this Nernst glower can be placed in an oven, and by reason of its intense light of different color will throw a strong light on the object which is being fused.

Dr. LeCron is quite correct in saying that the judgment of the dentist is affected by the surrounding light. If he were fusing a bit of porcelain at noon, and a similar piece at six or eight o'clock in the evening, his sense of judgment would be modified by the difference in the surrounding light. I was surprised —although it must be reasonable—to find such a wide range.

I believe the essayist said there were about 350° of heat difference; and even a person who has become expert will be misled unless he takes into account the time of day at which he is taking his reading.

He spoke of always placing the piece in the same part of the furnace. That is essential in furnaces which do not produce an even heat throughout the oven.

One which is wired on all its walls will give an even heat throughout.

An oven which fuses evenly is necessary, not so much because it facilitates determining the degree of heat in the furnace, but for the sake of the porcelain. A piece of large size cannot be fused evenly, even with the ovens on the market today.

Now as to the certainty of this method: We have had all forms and devices from the most delicate pyrometer to an ordinary thermometer to which the heat is conducted through a platinum wire; yet these are all so susceptible to outside influences that they do not compare with the method which Dr. LeCron proposed.

We might suppose that this alloy would vaporize, and its fusing-point would change; but we must bear in mind that the nugget simply attains the melting point; it does not remain in a melted condition for any length of time. If you do not lose the pellet, in course of time, even after six months' or a year's use, it will be about the same as it was at first.

Now as to the porcelains themselves. I do not believe we realize that to some extent a chemical action takes place when the porcelain is fused. Put different metals together, melt them up, and you will have an alloy of the different metals. It is more than that when you are melting porcelain. There is to some extent always a slight chemical action going on, so that in the finished product you have not an alloy, if you may call it such, but almost a changed product. That has been my belief as regards the melting of porcelain.

Dr. J. H. London, Washington, D. C. I appreciate very much Dr. LeCron's method of obtaining the fusing-point of the various bodies, the only objection being that it necessitates looking into the furnace, which of course is injurious to the eyes. In trying to obviate this objection, I tried a soapstone slide into which two small platinum wires had been run, leading from a dry-cell battery connected with a bell. The points of these wires were so arranged that when the alloy (as described) melted, it would run into a hole in the slide, connecting the wires completing the circuit and ringing the bell. This experiment was not successful, but I hope that some of you, who are better electricians than I, will develop this into something useful. Why could not carbon be used at the contact points? The only trouble with my experiment was that the alloy would injure the platinum wires, thereby rendering them useless for the next baking.

Dr. J. P. Corley, Greensboro, Ala. I was very much taken with the clinic this morning which demonstrated the method which the essayist has put before us this afternoon. However, to those of us who have not the privilege of owning an electric furnace, and must confine ourselves to the gasoline apparatus, it is impossible to use this method. The heat comes from the posterior aspect, and if we set the soapstone receptacle between the end of the muffle and the piece we are fusing, the soapstone receptacle will certainly become hot before the temperature in the furnace attains an equal degree of heat, and there is not room for the piece and the soapstone receptacle to set side by side. Therefore I do not see how we could get the same temperature on the two pieces at the same time.

Dr. LeCron. I never used the gasoline furnace, but I think the heat would be uniform. If it were, it could be used with a soapstone crucible, as well as the electric.

Dr. London. It occurs to me that if you use a piece of soapstone to carry your piece in, and put it at an equal distance from the side—for instance, if your porcelain filling should be on this side, and your piece of metal on that side [illustrating]—the heat would fuse both at the same time.

Dr. Custer. The point is this: wherever you put your porcelain once, put it again. Have one place for the porcelain, and another for your testing appliance. If it heats differently in different parts, two or three experiments will show you the result.

Dr. LeCron. I wish to thank Dr. Custer and the other gentlemen for their kind words in the discussion of my paper, and I thank you all for your attention.

There being no further business before the section, Dr. Butler announced its adjournment *sine die.*

SECTION III: Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

Chairman—J. D. PATTERSON, Kansas City, Mo.
Secretary—W. H. G. LOGAN, Chicago, Ill.

THE first meeting of Section III was called to order at 2.30 P.M., Tuesday afternoon, July 25th, by the chairman, Dr. J. D. Patterson, Kansas City, Mo.

The first order of business was the reading of a paper by Dr. L. C. TAYLOR, Hartford, Conn., on "Some Modern Thoughts Along the Line of Oral Hygiene."

[This paper was printed in full at page 147 of the DENTAL COSMOS for February.]

Discussion.

Dr. J. Y. CRAWFORD, Nashville, Tenn. I did not hear all of the paper, but was much entertained by what I did hear. I can concur in much that was said, but one little point I would like to controvert, because I think it mistaken. The doctor suggested that the sensitiveness of the dentin was probably more frequently due to disturbance of the pericemental structures than of the pulp itself. I believe that to be so markedly wrong that it will injure the value of the contribution. The truth is, that we have been laboring under a mistaken idea about the sensitiveness of the dentin. I firmly believe that every human tooth that is abnormally sensitive to cutting indicates some type of abnormality. Perfectly normal human dentin in a normal person should not be abnormally sensitive to cutting. Dr. Andrews has said it should not be more painful to cut in one direction than in another. As to the etiology of dentinal irritability, I am inclined to believe it originates in one of three or four ways. I believe it is sometimes trauma—teeth that are now non-sensitive can thus in a few months be made painfully sensitive. I believe that some dentin, from the effects of sepsis, may become painfully sensitive to cutting; that owing to nervous irritability it will be changed from a normal physiological condition to one that is pathological and painful. I believe that if a full comprehension of this truth were grasped and acted upon by the dental surgeon it would be a factor in his uplifting. As for the hypersensitiveness of the dentin depending upon pericemental irritation, with the modern means of anesthetizing the tooth—even the most hypersensitive—under great pressure, we can anesthetize and surgically remove the entire pulp tissue without pain. I believe it is through the medium of the pulp that the dentin is made hypersensitive and diseased. I am glad to have heard the paper, and to have had this point brought out.

Those who have hypersensitive dentin have decayed teeth, and the sensitiveness is pathological. I believe that in the decay of the teeth there is a nervous phenomenon that has not been observed and classified. The variable degree of sensitiveness—from non-sensitiveness to hypersensitiveness—indicates that it is not the normal condition.

Dr. N. S. HOFF, Ann Arbor, Mich. While I do not care to disagree scientifically with the last speaker, I hardly see how we can always think of a condition of decay of the dentin as being responsible for sensitiveness of the teeth. The sensitiveness of the tooth does not come from the dentin. The pulp is the center of sensitivity, and it is only by its irritation, whether it be from decay, or mechanical and chemical irritation, that the irritation is experienced. I think Dr. Taylor has rightly concluded that it is irritation of the pericemental tissue, because that is a more common source of irritation than is caries. We frequently have dental caries present in the mouth, but we have also more frequently irritability of the gum tissue and the peridental membrane, and reflexly the pulp must be irritated. The theme of the paper is just now very popular, and it is deservedly so. There has no method of practice come into such popularity in our profession for years, nor none that promises so much for the uplifting of the practice of dentistry as does this question of prophylaxis. I remember that several years ago Dr. Crawford made the statement that there were not dentists enough in practice to keep clean the people's teeth. In my judgment there are not half enough even now to do so. If we should all give this matter the same attention as do such men as Dr. Smith and Dr. Taylor, we should have much less reparative dentistry to do. We could keep busy every man now practicing dentistry, with profitable advantage to the public, and if they would do this, even to the neglect of other work, I do not believe the people would suffer more than they now do from the ravages of decay. I believe the question of susceptibility and sensitivity of the dentin can be almost entirely obliterated by the application of prophylaxis to the teeth.

The question of the use of proper filling materials, is an important prophylactic measure. The essayist did not emphasize this as much as he should. I believe the use of porcelain for filling teeth, or of other materials with which they can be properly contoured and replaced in their normal condition, with prophylaxis, promises more benefit to the public than anything that has ever come before the profession. We all rejoice in the investigations of our scientists as to the cause of tooth-decay, etc., but in my judgment it is not to be compared with this question of the proper care of the teeth.

Dr. A. W. Harlan, New York, N. Y. I was unfortunate in not being able to hear all of Dr. Taylor's paper, but I judge the trend of it was with reference to the conservation of the teeth through the prevention of caries, etc. I have had occasion during the past several months to spend considerable time investigating the habits of man with reference to the choice of his food and the use of it, and it seems to me we must pay more attention to the use of the teeth in maintaining the mouth in a state of health. If the foods we eat are soft, semi-liquid, and liquid, and are swallowed without mastication, necessarily, after a time, the stomach refuses to perform its functions, and we have a train of intestinal disorders which are reflected in the mouth and ultimately affect the teeth. Therefore, in addition to the means of removing all kinds of external concretions from the teeth, we must insist upon a proper mastication and upon a reasonably mixed diet, so that the teeth shall have that degree of exercise that will tend to promote the best general nutrition of the whole body.

Dr. J. P. Corley, Greensboro, Ala. Unfortunately, I did not hear all of Dr. Taylor's paper, but what I did hear interested me very much, for oral hygiene has always been my hobby. I think the essayist struck the keynote when he said that primeval man kept his mouth clean, his teeth well exercised, and permitted the wholesome development of the mouth, maxillary bones, and muscles of mastication; in the grinding process not only cleansing his teeth and massaging the gums, but attaining a wholesome, healthful condition of the oral cavity. In regard to this new phase of prophylaxis, which has been specialized into a technical vocation, I must say that I am not in sympathy with it. If we do the scrubbing which the patient should do for himself, we not only humiliate ourselves in a professional sense, but rob the patient of the practice and the technique which would enable him to do the work himself. He could do it once or twice a day and maintain a clean condition; but if we have him come to us once or twice a month he will not undertake it himself. I take the position that after the accretions have been removed any intelligent person can more perfectly cleanse the mouth himself than can an operator, and if he is properly impressed with the necessity for it, he will do it, and keep it done, instead of waiting until he goes to a dentist to clean off the teeth. It is discouraging to hear such representative men as some we have in our profession preaching this doctrine of the dentist doing what the patient can do for himself. We have the disadvantage that for several generations we have been munching and swallowing soft food, so that there has been an atrophy of the muscles of mastication and a contraction of the arch, which has practically put the human denture out of commission. We should begin preaching a reformation in the cuisine, and make a demand that we have a *régime* that will permit us to clean our own teeth and return to natural methods.

Dr. Hoff. I do not believe the gentleman who has just spoken has ever had this work done for himself, or he would not make the statement that it is demeaning. It does not demean us at all, but is the most manly thing we can do. I cannot do such work in my own mouth, and I do not believe anyone can instruct a patient to do it adequately. I believe the gentleman is conscientious in his statement, but he does not understand the operation, nor look at it from the right standpoint. If he had seen the results from this work that I have, he would not place himself in the catalog of a scavenger. I am glad to do this for anyone who needs it, and were I in a position today to change my location, I should go to a large city where I could specialize in this particular branch of our profession, and would do my work so thoroughly that I should never be ashamed of it, and believe that my patients would appreciate it so fully that they would be glad to honor me for my skill.

Dr. Taylor. I want to thank these gentlemen for the courtesy they have shown me, as far as I have been able to hear it. I labor under some disadvantage in that regard. Dr. Crawford speaks of extirpating the pulp. I believe in that in some extreme cases, but my teachings have been to lead people back to the first principles, and as we can do these patients such an immense amount of good, we should not wait until the case has passed to the point where the extirpation of the pulp is a necessity. The sole point of all our teaching should be to give better care to the oral cavity. That is what we need. It is for the good of our patients; it is for our good. I believe when people bring their work up to the standard that I wish to see, that we can more than double the work—in quantity—that will be demanded at our hands. It is this careless way of letting things go that causes people to become disgusted, and a great deal is brushed to one side. I believe our first duty is not so much to begin to teach the patient as it is to begin to do our work well. You will find the patient soon becomes interested, and will say, "Doctor, what can I do to help between times?" Then you can handle them. Do not tell them to do something you have not done yourself. When you have left a dirty edge extending under the gum, such service is worthless; and worse, because it deceives both the dentist and patient. Talk to the dentist first, and get him to do the work well, and I will risk the rest of it for the patient.

The subject was passed.

The next order of business as announced by the chairman was the reading of a paper by Dr. Horace L. Howe, Boston, Mass., on "Hyperacidity of the Saliva: Some Causes and Some Effects."

[This paper was printed in full at page 143 of the February issue of the Dental Cosmos.]

Discussion.

Dr. J. P. Corley, Greensboro, Ala. It would be unfortunate to let such a paper pass without comment. It is something that has not been brought to our notice much, but there is a good deal in it. I think we should follow the subject farther. I think, however, the essayist has laid too much emphasis on the influence of the alkaline reaction of the saliva, and its stimulation of the gastric glands. That is of very little importance, because the act of mastication itself has a very decided stimulating effect on the glands of the stomach, but I believe, gentlemen, the most profound stimulus comes through the sense of taste. We are all familiar with the phenomenon which takes place when our olfactories inform us something good is going on in the kitchen. Our mouths water. The reflex action on the salivary glands is profound, and the effect of taste on the gastric glands brings about a corresponding stimulation there, together with the act of mastication.

Another important consideration is the aeration of the food. We are familiar with the effect which a sodden biscuit has on our stomachs. It is because the particles of gluten are not separated, and it is something like acting on stone; the only part which can be acted on is the outside, but if it be separated by particles of air, when the bolus goes into the stomach it is permeated by the gastric juice. So we have a good many factors to consider in this act of mastication, and it might be followed out still farther. The subject of the paper is a very important one. Our medical friends a few years ago raised a great cry for pre-digested foods, and the manufacturers put upon the market all sorts of concentrated extracts, thereby robbing the stomach of its normal stimulus. The food went into the reservoir, where it lay without being taken up. Now we are crying for grindable food, and they have gone to making shredded foods which offer abundant opportunity for mastication, which we so much need. I am glad that scientific men are looking around and studying nature, which is the great teacher of mankind.

Dr. R. T. Oliver, West Point, N. Y. I have listened with great interest to this paper. It embodies a number of important points that should be taken up for careful consideration. The theory as to different classes of food being required by individuals in different climates may be true, in so far as it pertains to the natives of the respective climates, but certainly does not apply to persons from a temperate zone going into the tropics for a more or less temporary residence.

Having just completed a three years' tour of service in the Philippines, I base my objection upon conditions observed, and upon experiments tried there. It is true that a vast majority of the poorer natives do eat the so-called tropical food, composed of fruits, rice, fish, locusts, etc., but whether such food is more beneficial to them than that of another character would be is a matter of considerable doubt in my mind. The cause of their selection of this class of food may be on account of an inherent instinct to take only what is good for them, or it may be due to some sort of a craving for just such articles; but I must say that I am inclined to be skeptical of these beautiful theories, and rather suspect that the real reason the native takes to the "tropical" food so readily is because it is easiest to get, costs practically nothing, and requires so little energy either in procuring or preparing it.

The average Tao's board bill comes very near being nothing a week, the only expense being a few centavos for rice. It is true they thrive on it, can work all day (when kept at it), and can stand long marches or "hikes" through rough mountain or jungle country, and it is also true that such a diet is not a heat-producing one. But on the other hand, the *personnel* of the Philippine scouts, our colonial army, have been doing excellent work, demonstrating great powers of endurance under splendid health conditions, upon the regular army ration of meat, bread, potatoes, etc., as used by our army in this country.

In contradistinction to this, experiments have shown that the American in the tropics, when taken off his regular bread, meat and potatoes ration and put on experimental fruit or vegetable ration suitable for the tropics, did not thrive well, soon began to fail in strength, physical endurance, and resistance to disease, and had to go back to the old regular temperate-zone food.

Therefore it would seem that the character of food for the various peoples of the earth depends, indirectly at least, upon the natural habitat of food products, ease of procurement, facilities for preparation, and upon the individual's taste, habit, idiosyncrasy, or choice.

A remarkable fact in regard to the possible effect of certain foods producing an apparent immunity to certain diseases, was noticed during the terrible cholera epidemic in 1902, when over 100,000 people died from that disease. Our American soldiers stationed throughout the archipelago, and freely mingling with natives at all the towns and villages throughout the most plague-ridden districts, did not succumb to the disease as did the natives.

At first glance an explanation might be advanced that the American soldier, being fed on a better class of food, was stronger and more capable of resisting the invasion of disease; but another and more logical explanation is that the American was a meat-eater, a consumer of nitrogenous foods requiring in the stomach large quantities of hydrochloric acid, which attacked the outer capsules of the cholera germs, thus permitting of their complete destruction by the digestive fluids before they could advance far enough into the system to cause trouble.

The poor fruit and vegetable eaters readily succumbed to the dread scourge, being wholly unprotected, and at the mercy of the insidious water-borne germ.

Dr. Howe. I wish to thank those who have spoken. Respecting the criticism of Dr. Oliver that the food of different climates was adapted to the men of those climates, I would say that the statement was intended as a very general one, and to counteract the vegetarian idea prevalent in some places. I think an entirely vegetarian diet in the arctic zone would be bad.

Dr. Oliver. The generally prevalent idea is that the climatic environment largely selects the food. That is largely so from the native standpoint. The native could not live on our American meat diet. He would not last.

The next order of business was the reading of a paper by Dr. B. J. Cigrand, Chicago, Ill., on "Mandibular Action: Its Influence on the Entire System," as follows:

Mandibular Action: Its Influence on the Entire System.

The title of my paper might induce some few of you to the conclusion that the subject more properly belonged to a medical program, hence should be pronounced foreign to dental consideration. The fact that the general system is under consideration should not lead to the inference that as practitioners we should forego the privilege or duty of giving the matter thought, nor should it foster the idea that we are usurping beyond dental limitations. As time goes on it becomes more apparent that our professional duties indicate that we concern ourselves more diligently with every phase of human disorder induced or provoked by any dental disturbance. This may seem a rather broad definition of our calling, yet our service is limited by legal rather than by physiological laws.

Our profession would at this day and age receive greater consideration could we impress the public with the fact that our services are truly important, and that organic and functional disorders throughout the human system can be directly traced to abnormal or disorganized oral conditions. I know of no method, policy, plan, or purpose which would more engender public respect than the one calculated to educate the masses to a realization of the broad and far-reaching influence our services may have upon the general health of the person.

Your committee asked that I write this paper, and the request, I am informed, was prompted by the cordial reception recently extended when I read before the Chicago Medical Society my paper entitled "Systemic Health, Its Dependence on Dental Order." In my paper before this association I hope to emphasize features of the subject that were merely touched upon in the former article.

Possibly the most interesting theme of all life is the subject of cell physiology, and the possibilities which this *kentniss* possesses is far beyond the ability of the human mind to describe. If we thoroughly understood the single cell, all living bodies with their wonderful complexities would soon resolve themselves into plain and easily understood objects. The recent experiments of Prof. Robert Hamilton tend to prove the existence in every highly organized development of two lives, the one a life resident in every atom of the structure, the other the unity of all these atomic lives—a life for which we have failed to find an expression. Notwithstanding that the atomic lives are subordinated by the grand or central life, the latter is dependent on the atomic energy, and a co-existence is established which science has yet to solve.

Just as each atom contributes to the entirety, so every fiber contributes to the organ, and in turn every organ donates to the perfected whole. And in the same ratio the entire organism depends on the parts or subordinaries. Every fiber in animal life is subject to development or decadence. The progression or retrogression is dormant or alive according to its size or importance. In animal life activity and development are synonymous terms, while disuse and waste are similar words. In the animal kingdom the forces of destruction are constantly at work, and the forces of renovation and repair are equally active, but they do not remain perfectly matched, for at times the energy of the mind or body may be so great as to overtax the residual forces, the physical being becomes exhausted, and if this activity be continued the body soon suffers, as indicated by loss of weight and lack of mental vigor; and again, we may have the forces of repair the ruling agent, and the mind is clear, the body strong, and the entire nervous system alert and vitalized. This constant war of forces is largely supplied by the food we eat and the mental energy supplied. A sluggish person, slow of movement and of thought as well, does not destroy the cellular life as rapidly as one who is active and industrious; but the latter has the advantages of living under the influence of new and quickened vitality, since his energy wastes the elements and eliminates this waste product, while the indolent harbors this poisonous matter because of the lack of molecular and fibrous exercise. Every action, be it mental or physical, necessitates destruction; and the tissue or part which has been affected must of necessity be restored, or the waste would be greater than the repair, which would mean early decay and death. A wise arrangement in nature provides for this loss, and rebuilds the broken-down tissues of the body continually. By this process of animal restoration, so far as weight is concerned the body might be renewed several times in a week; but the pounds of food we eat are not all nutriment to the human frame. A considerable portion of what we eat is innutritious, and though useful in various processes, is not destined to repair the losses of the general system. To meet these constant chemical changes two materials are essential, food and air; and during the first half of our lives the repair somewhat exceeds the waste, and our bodies grow larger, stronger, and heavier; while in the latter portion of life the opposite force seems to govern our destinies.

Nutrition and repair have come to mean the same, and both are symbols of life. The rapidity with which these changes are carried on is far greater than is usually supposed. Paley, in his "Natural Theology," claims that the entire living organism is renewed in seven years; but recent investigation has cast aside the mystical figure seven, and has substituted in its place the word "time."

Nature despises disuse. She has a standing resolution which reads, "The idle and unused shall be cast off," and this applies to the teeth, which, allow me to say, are no exception to this edict. If you were to have your right hand bound close to your chest and it were to remain so for a period of one year you would not be able to control it upon emancipation. Use and development have come to mean the same, and nature furnishes an example in the sightless fish at the Mammoth Cave, Kentucky. Nature says, Why have these eyes, when they are not used? Atrophy in nature, as in political life, means waste and death: as in the whale the teeth are embedded or incased in the jaw and never erupt; the whale having no use for them, nature does not beget the teeth. All life testifies to the primordial law that what is not employed shall be gradually destroyed.

The general public in the cities have been inoculated by the virus known as haste, hustle, and hurry. Their meals are eaten in five minutes, and only substances requiring little chewing are chosen from the bill of fare; and we have learned long since that the teeth need organic exercise. Hasty eating brings with it deranged alimentary conditions, and this always means an acid bath for the teeth, and this means eventual destruction. If the American people are suffering from a general disease it is indigestion superinduced by insufficient mastication of foods. Hasty eating and modern cooking have eliminated more good teeth than has accident or old age. While visiting England I was impressed with the good sense of the people in that they observe the rules governing appetite better than we who excel in our love for the pleasure of life. It is quite perplexing to the American to be obliged to spend so much time at the prandial board, but the English custom of "loitering at the meal" is indeed an expression of national wisdom. Washington Irving, in his "Sketch-book," clearly portrays the English love for a "good substantial dinner," and throughout the Continent as well the folk seem to take the full hour for dinner. The old saying, "After dinner sleep awhile, after supper walk a mile," has grown obsolete, and belongs to an age when people worked to live, while now we live to work.

Again, we overlook the necessity of jaw movement in the process of digestion. Foods which are "prepared," so called, require little mastication, and in taking them we cannot guard against dyspepsia and kindred stomach disorders. The food must be left in the mouth sufficiently long to be saturated with saliva and to assure its liberal flow; the jaw must be set in motion. Oatmeal, and the various breakfast foods, do not require this, and the sucking or mere process of deglutition does not bring forth the saliva, and hence the proper action of the saliva is omitted, and this will have its ill results on the effect and force of the food. We should choose such foods as will stimulate the flow of saliva and develop the glands and strengthen the secretions. Select foods which exercise the teeth. This stimulates the circulation in the peridental membrane and induces a quickened circulation in the tissues of the gingiva, and possibly wards against pyorrhea and other forms of diseases of waste.

The mere moving of the jaw as in speaking does not stimulate the glands sufficiently. Experiments which I have made have led me to conclude that the parotid and submaxillary glands are provoked into action by tension of the masseter muscles—that these muscles during their vigorous activity stimulate these glands.

The mind exercises a powerful control over all atomic life, and the student of cell physiology, as well as the pupil of nature, need not go beyond their own bodies for a laboratorial or ocular demonstration.

One hears and reads much in these times of muscular and athletic development induced by exercise and mental influence. This cannot be known as a new idea; the basic thought of this system can be found in a sentence by Darwin in his "Descent of Man," page 30, where he speaks of re-developing organs or nerve or muscular fibers as follows: "I have seen one man who could draw the whole ear forward; other men can draw it upward; another who could draw it backward. It is probable that most of us, by often touching our ears and thus directing our attention toward them, could recover some power of movement by repeated trials."

That the exercise of the jaws and mental direction changes the face I firmly believe. I have observed in patients who had suffered the loss of most of the teeth on one side of the mouth that the cheek was thinner and more flabby. I concluded that this was entirely due to the loss of the teeth, but I have come to believe that since the patient cannot masticate where there are no teeth, the entire exercise is conducted on the side containing teeth. The additional work placed upon this side of the mouth develops the salivary glands doubly, while on the opposite side atrophy practically sets in, causing absorption and thinness of the cheek.

Again, nature has so arranged the salivary system that the glands will only respond on that side of the mouth where actual mastication is in progress, again proving that the glands excrete only under pressure. The sucking or mere swallowing, as is done in eating soup and soft foods, does not beget a free or full flow; movement of the jaw is not sufficient; it requires pressure. The jaws must be forcefully brought into antagonism, and thus produce an effect on these glands. Besides the action of the jaw, the mind should exert its influence upon both jaw and glands. The effect of mind over body is well and most easily demonstrated regarding oral secretions and flow of buccal mucus. Mental exertions exert a control over its flow, sometimes diminishing it as in moments of great anxiety. Its flow is often completely stopped by fear, while suggestion increases it and not infrequently induces an abundance of the watery fluid.

The saliva has many functions. It is a necessary intermedium in the sense of taste: substances to be sapid must be more or less soluble in this juice; if insoluble, they are tasteless. It moistens the interior of the mouth, aiding the art of speech. But, chiefly, it promotes the process of digestion, and with this latter fact we should be more concerned, since its flow is, I believe, controlled by the activity of the jaw—I do not mean by mere jaw movement, but jaw action. Nature requires that the food shall be crushed and pulverized by the teeth, and softened and chemically changed and prepared by the saliva, and when these two processes are accomplished, the food is ready for the stomach. The present prepared foods do not beget jaw action, hence I contend do not receive the proper amount of parotid saliva, and the foods lacking this pre-stomachic treatment must of necessity lack in the blood-producing elements. The mischief of this poorly prepared morsel may be one of the prevailing ailments of dyspeptics, and may also be conducive to the ravaging increase of consumption. Tuberculosis makes great headway in any system that is exhausted; in any person whose vitality is low; in any individual whose energy is lessened through impoverishment of blood. The action of the jaw being omitted, the flow of the parotid saliva is scant, the food morsel improperly prepared, digestion disturbed, the blood impoverished, and hence, with the lack of organic and systemic energy, tuberculosis, pyemia, and all consuming diseases readily progress. All this destruction of human life has been aided, not induced, by disregard of the cardinal principle of digestion, by our present methods of hasty eating, giving neither thought nor time to the process of manducation and mastication—the human or civilized species disregarding nature's greatest and most divine requirement, histogenetic digestion. A case recently brought to my attention may be of interest in this direction: A young lady patient who sustained an injury to the temporo-mandibular articulation, resulting in positive immobility of the jaw and in her being obliged to exist on liquid food, gave evidence of the immediate effect of jaw and dental exercise in that her teeth loosened and the parotid saliva practically ceased flowing, her health soon disappearing.

Men versed in the art and science of stock-raising will bear testimony that cattle, as well as swine, which are denied opportunities of vigorous jaw exercise soon lose the teeth and become diseased.

While pyorrhea alveolaris is classed as a disease, gomphiasis must be termed a physical condition that is sometimes noted in middle-aged persons. Gomphiasis presents the same relation to the physical economy that gray hair does—being indicative of age—but not necessarily so. In gomphiasis the teeth are loose, they seldom present decay, and are of a cream yellow shade. There are no signs of alveolar absorption or the presence of waste product or pus. The teeth are generally long, and possess ill-shaped cusps; never bell-shaped, but rather of cubic outlines. My attention was directed to this abnormality something like twelve years ago. Gomphiasis is so akin in its manifestations to pyorrhea alveolaris that many practitioners make the mistake of treating it with medicines and instruments adapted to pyorrhea, and meeting with ill results are apt to pronounce it a stubborn case of gingivitis, and invariably recommend the extraction of all the teeth, substituting artificial ones, when it remained within the dental province to restore and save the natural dental organs. The extraction of teeth in such a case is entirely contra-indicated, inasmuch as appliances will give stability to the affected parts, and they will speedily yield and become normal in character. The abuse some dentists accord in case of this defect is astonishing. A healthy tooth submitted to such digging would induce a severe and distressing inflammation.

I have observed that cases of gomphiasis are mostly found in people of the lymphatic temperament and cannot be termed an abnormal condition, inasmuch as the osseous structure of their being is of a less dense or firm nature. The gums are naturally flabby and the entire system is rather of a lower form. We may readily recognize this temperament by the following general and special characteristics:

The lymphatic temperament. To the ancients known as the "phlegmatic." This temperament might be called stomachic or digestive. External indications: Round and well-developed jaws. Constitutional outlines fleshy and bulky; general movements slow and sluggish. Hair coarse, straight, and drab. Fingers short, flabby, and cold. The jaws have a decided lateral movement. Teeth-cusps flat, and rugæ indistinct.

The primal requisite in treating a true case of gomphiasis rests in rendering stability to the troubling teeth, and in granting exercise to the jaw.

The subject of mastication is one in which we as dentists ought to be profoundly interested—not alone in the *genus homo,* but in the entire animal kingdom, since a full understanding of the process of eating and the philosophy of mastication can come only after a diligent study of comparative anatomy. Now, I believe that all animals having teeth eat, yet not all animals having teeth masticate. To me the word mastication means the process of cutting, grinding, and crushing of food; and this word according to such inference relates most happily to man, since his jaws admit of the functions of cutting, grinding, and crushing. So that the essential event sought is to establish a tightness of these teeth by natural means and hence afford nature the opportunity of restoring the wasted parts and rejuvenating the affected regions.

I have aided patrons most emphatically by advising the chewing of spruce gum or tar, and in some few instances have cured what was pronounced a distressing form of pyorrhea alveolaris. I hold to the opinion that too many teeth are treated as pyorrheal which simply require action of the jaw.

Our crowns and bridges would last longer if we instructed patients how to put force upon them. As it is now, practitioners dismiss the patient with the edict, "Do not bite hard on the attachment, as it will not endure under severe stress or strain." The result is that the teeth or roots upon which the case is anchored are jealously guarded, and no jaw force exerted. The roots soon, from disuse and protection, become loose, and the bridge or crown becomes a failure because of professional warning. Better instruct patients to bite naturally, using the normal force, even at the expense of repairing or of constructing new appliances; the patient's appearance is secondary to his health. It may be esthetic to place on a short bicuspid a porcelain crown, and it may be acceptable to caution the patient against eating on that crown; but I hold it better dental service to adjust a well-contoured and accurately fitted gold shell and say to the patron, "Now, use that side of the mouth; eat naturally, and retain your health." Porcelain has its place; porcelain has its mission; but when I find that I cannot use bulk and get substantial results, I somehow still hold that the properly formed and carefully adjusted gold molar has merits congenial to the laws of physiology.

The dental profession should not construct appliances which will hinder normal masticatory forces. The action of the jaw, its influence on the osseous and vascular tissues, together with its effect on the six major oral glands, and the innumerable minor ones secluded in the cheek and mouth, should not be jeopardized to frail and pretty prosthetic substitutes.

Our field of work leads us to give our attention to the minute changes which are constantly going on in the oral cavity. The alterations may be physiological or chemical, and their results may affect the most distant parts of the body. This study belongs to us; we should have the right to advise our patrons regarding their health, provided the mouth or teeth contribute directly to that end. By this means we shall render service along lines in strictest harmony with our training, and tend to give greater importance to one specialty of medicine.

Discussion.

Dr. A. O. Hunt, Omaha, Neb. I am very much interested in the papers I have heard, as they are all along the modern lines of prophylaxis. Of course some of it is classed as new. It is new to the extent that some attention is being paid to it, and properly so. Mostly the papers have treated of physiological conditions with which we are familiar, and still, although we are familiar with them, we do not give the patient the benefit of that knowledge to the extent we should in our instructions to them. The use of the jaws is a very important thing in the mastication of food. Without such use we could not get the proper stimulation of the salivary glands in the oral cavity, and without the proper condition of the saliva we cannot get the proper digestion. It has often been a question in my mind as to what kind of food suits mankind best. Some people cannot eat a morsel of roast beef without distressing conditions following. Another man cannot eat an apple without distress. Another could eat a box of fish hooks or a log chain, and never know it. The stomach of the individual has everything to do with it. Just now everyone is talking of the proper mastication of the food, and the absolutely cleanly condition of the mouth. The correct mastication of the food has much to do with keeping the dental apparatus in good order. We can hardly deny the fact that the dental organs have something to do with the final results of digestion and assimilation of the food. Nature could not have been wrong when she made the tooth the first organ of the body to be developed. There must have been some important reason why the development of the teeth should begin so early in the evolution of the fetus. The teeth are practically indestructible under natural conditions. It requires abnormal conditions and surroundings to destroy them. We see this result clinically and we have every evidence of that fact. A tooth may lie out on the prairies for any length of time and its enamel not be destroyed or injured in any way, while the bony structure of the jaw in a skeleton exposed to the same conditions would break to powder in the fingers. And so the teeth are found as fossil remains in the rock. They are taken out ages after their deposit with the enamel not changed or destroyed. So then, the normal structure of the tooth must be of paramount importance. We abuse it just the same as do our patients; do not take any better care of our teeth than our patients do of theirs. It is the surrounding of this ordinarily indestructible material with conditions that ought not to exist which causes the trouble, but a clean tooth will not decay.

Dr. A. W. Harlan, New York, N. Y. One of the most remarkable things that has occurred recently in dental meetings in connection with the preparation of papers, is that almost all of them have been on the consideration of oral hygiene, prophylaxis, and the use of the teeth in mastication. Last week I presented a paper on food before the New Jersey State Society, and this afternoon we have listened to three papers in this section, in each of which the principal idea has been with regard to mastication to produce perfect assimilation and nutrition. Dr. Cigrand's paper goes on, supplementing those of Dr. Taylor and Dr. Long. As I presented my paper last week, at the present moment I am ahead of all three; but the ideas are good, and the more they are disseminated to our patients, the better for the patients. If you hammer it into the minds of people that if they have teeth they must be used, they will choose the kind of food that will give to the teeth exercise. Dr. Oliver's remarks with reference to the Philippine Islands were timely. I have had occasion to read about the food habits of the Polynesian Islanders and the people of Iceland and Greenland. Most of them use the food necessary for the climate in which they live, but there are some exceptions. According to the experiments made on the soldiers at Yale College, it was found that a man weighing 147 to 154 pounds will eat and drink in twenty-five days about the weight of his body; one and a half parts of which will be solid food, and four and three-fourths will be moist. In order to maintain what is known as the physiological balance, certain amounts of food must be ingested daily; when, therefore, in the effort to preserve foods, benzoic, boric, salicylic, and sulfuric acids with other substances are used, and more than 7½ grains are taken in the food daily, the stomach will rebel; flesh will be lost, the skin lose its bright appearance and the hair and nails be affected. Therefore I think if the forty thousand dentists in the United States will tell the people how to use the teeth, some of the diseases now prevalent will disappear in consequence.

Dr. Cigrand. I think it is an indication of progress on the part of dentists of this country that they are giving attention to so important a subject. I am glad to hear the words of Dr. Hunt and Dr. Harlan regarding the profession's interest in such subjects, and also that instruction should be given to our patients. If each one would tell his patients these simple and ordinary physiological truths that most of them think they already know, it would make an impression. Many would say, "Of course we use our teeth; that is what they are made for," but it seems sometimes that these things we ought to know, and think we do know, are the things we know the least about, after all. I am very glad that the interest has been along this line. I have given it years of study from the mechanical side, am deeply interested now from the standpoint of the physiologist, and presume later I will be from that of the chemist, because these three sciences must work in harmony, being so interwoven that one cannot stand without the others. Dr. Hamilton gave the idea that the use of teeth is one of the primary requirements of life. Dr. Kidd of London said that appendicitis could be traced to the fact that we are not using our teeth properly, disregarding the principles of mastication. I believe one of the London medical journals stated that Kidd, who had probably performed more operations than any man on the Continent, said that appendicitis will pass away just as soon as we learn how to eat. If that be true, no higher compliment could be paid to the importance of our profession.

A paper was then read by Dr. A. W. Harlan, New York, N. Y., on "A Review of the Question of the Treatment of Putrescence as Related to Pulp and Pulpless Teeth," as follows:

A Review of the Question of the Treatment of Putrescence as Related to Pulps and Pulpless Teeth.

In this paper I do not presume to answer the question of what putrescence is, as related to the pulps of teeth, but I will premise that the whole subject is still worthy of the profoundest thought. I will however answer briefly that it is the destruction of the pulp through irritation, inflammation, and the agency of micro-organisms producing suppuration. This was guessed at more than a hundred years ago, and teeth with putrefying pulps were cleansed of their contents and afterward filled with lead, cotton, and many other substances. It was not until the dawn of antiseptic surgery that the real nature of putrescence was understood as it affects the pulps of teeth. Even then the treatment of putrid matter in teeth was not based upon any defined method of destroying putrescent material. If you will consult the works of John Tomes, Chapin A. Harris, Thomas E. Bond, F. Maury, Lefoulon, J. Taft, or any other English, French, or German author before 1860, little was known or practiced in the destruction of the products of decomposition, ptomains or leucomains, putrescin, or any of the other varied *post-mortem* products.

With the advent of antiseptic surgery and the discovery that many hitherto unused drugs were inimical to germ life, our literature was flooded with numerous methods of handling putrescence and the stored-up poisonous matters that were infiltrated into dentin. Wood creasote, iodin, carbolic acid, zinc chlorid, alcohol, potassium permanganate, various oils and tinctures, all had their day. When knowledge concerning putrefaction became more widespread (about 1870) much of an amateurish nature was produced before the American Dental Association and the more prominent state and local societies in the United States and elsewhere. Even as late as 1881 works were published advocating the stopping of pulp-chambers with cotton soaked in glycerin to which had been added a little As_2O_3. Reform movements are accepted but slowly. Liebig himself and H. C. Bastian never would agree to the germ theory of disease, and they each had partisans and warm supporters. I heard Bastian read a paper in 1881 in which he still clung to the spontaneous generation theory of disease, and one day I had a long talk with him on the subject, in which discussion he maintained his position with great cleverness and much learning.

What is the definition of putrescence?

"*Putrescence*—The state of undergoing putrefaction." (Gould.) *Putrillage*—Putrescent material. *Putrescin*—A ptomain of decomposition. *Pus*—The fluid product of suppuration. *Putrescent, Putrid*—To become rotten."

"The formation of such gases as H_2S, PH_3, and $(NH_4)_2S$, give the offensive odor to putrefaction of soft parts." Tendency to, or incipient condition of putrefaction.

"If a tooth-pulp be allowed to decompose in a closed root-canal, an incredible amount of bad-smelling gas may be found, so that on opening the pulp-chamber the whole room will be impregnated with the odor H_2S, PH_3, and $(NH_4)_2S$." (Miller.)

Putrescence *per se* is not treated at any great length in the "American Text-book of Operative Dentistry." The most striking paragraph follows: "The septic cases . . . range from superficial ulceration of the pulp to its disorganization through the agency of putrefaction and the infection of the tissue beyond the apex of the root. . . . The second class of cases comprises those in which septic organisms have invaded the pulp along the direction of its veins and destroyed the mass of the organ through a process of suppuration."

"Fermentation produces acids; putrefaction produces alkalies. In the latter case, as already alluded to, ammonia and its derivatives, the amins and amids are characteristic together with exceedingly poisonous and non-poisonous ptomains or animal alkaloids." (Cassidy.)

"Fermentation and putrefaction resolve a complex substance into a simpler form by contact with a minute living plant or animal." (Thomson.)

"Peptonizing ferments convert coagulable albuminoids into soluble and diffusible albuminoids or peptones, which are neither precipitated on boiling, nor by copper sulfate, ferric chlorid, mineral acids, or alkaline salts. Precipitable by chlorin, tannin, mercuric chlorid, silver nitrate and lead acetate, neutral or basic." (Thorpe.)

Putrescin is not destroyed by boiling or evaporation. It is insoluble in alcohol, but is soluble in water. Albuminoid substances which are frequently found in dead pulp are covered with putrescin, which is slowly dissolved with distilled water.

"A saprophytic organism attacks dead matter, but the pathogenic first of all attacks living matter and strives to kill it, and continues to attack it after it is dead. Sometimes an organ is facultative, then it attacks both living and dead matter." (Brunton.)

Often there is a struggle for existence between microbes, just as between higher animals, and if a number of mixed microbes are planted together in a nutrient medium, those will succeed first to which the medium is favorable. This is a simple statement of what is the known truth.

Putrescent pulps and putrescence in pulp-canals, and the consequence of putrescence beyond the apices of roots, seem at this day to have caused more trouble to dental surgeons and the people at large than all the other diseases of the teeth. All the energies of the chemist, the pharmacist, the therapeutist, and the bacteriologist appear to have been spent on discovering or producing antiseptics and disinfectants sufficiently potent to destroy putrescence and putrillage when within a root.

The journals from month to month grind out new papers on the treatment of foul root-canals with new drugs, or combinations of old and new drugs, so great in number that it is bewildering to a new graduate or even to the young practitioner. Have we at this day and hour a more potent destroyer of a coccus or bacillus than we knew of ten or even twenty years ago? At present the most recent books and papers are still struggling with the question—Geo. W. Cook, J. P. Buckley, J. D. Hodgen, and others, including MaWhinney in the latest work on oral pathology, who says that "the treatment of putrescent pulp is a simple matter" (page 94). Buckley proposes to treat putrescence with tricresol and formalin, using alcohol to separate the fat (?) and produce lysol, a soapy compound. Hodgen revives the sodium dioxid process of treating putrescence, while Cook advocates the use of phenol-sulfonic acid (phenol and sulfuric acid). MaWhinney's treatment is alcohol, beechwood creasote, "1, 2, 3," campho-phénique, tricresol, oil of cloves, etc. The Buckley and Hodgen methods, as well as Schreier's kalium-natrium process, are attempts to place the treatment of the putrescence of pulps and pulpless teeth upon a scientific basis.

A study of the ultimate products of putrefaction, and a determination of the varied substances found within a closed pulp-chamber is the basis for the treatment of putrescin. We have then to do with the peptones which are the "final, simplest products of the native albumins and neucleo-proteids." (Holleman.)

It is probable therefore that monochloroacetic acid CH_2—Cl—CO_2H, diluted to 7 per cent. in the beginning of putrescence is indicated, and that trichloroacetic acid, C—Cl_3—CO_2H, diluted from 7 to 12 per cent. may be relied upon to disinfect complete putrescence before the products have passed through the apex of the root. After that period has passed, surgery or any preferred method is indicated. After the destruction of the putrescin and putrid material and its removal, use a weak solution of dried sodium carbonate, $NaCO_3$. Any mild dressing may be sealed within the root-canal after this treatment—oils, or aqueous solutions of known disinfectants.

Works consulted: MILLER, "Micro-organisms;" AITKEN, "Animal Alkaloids;" BOEDECKER, "Anatomy and Pathology of the Teeth;" MORLEY and MUIR, "Dictionary of Chemistry;" THORPE, "Dictionary of Chemistry;" HARRIS, "Principles and Practice of Dentistry;" BOND, "Dental Medicine;" MAWHINNEY, "Oral Pathology;" VAUGHAN and NOVY, "Ptomaines, etc.;" LITCH, "American System of Dentistry;" KIRK, "American Textbook of Operative Dentistry;" LEFOULON, "Dental Surgery;" MAURY, "Dental Surgery;" TAFT, "Operative Dentistry;" MARSHALL, "Injuries and Diseases of the Jaws;" CASSIDY, "Dental Chemistry;" MITCHELL, "Dental Chemistry;" **Smale** and **Colyer**, "Diseases of the Teeth;" **Tomes**, "Dental Surgery;" **Abbott**, "Dental Pathology;" **Eames**, "Dental Pathology;" **Gorgas**, "Dental Medicine;" **Bloxam**, "Chemistry;" **Burchard**, "Dental Pathology;" **Cook**, **Buckley**, **Hodgen**, various recent dental journals; **Piggot**, "Dental Chemistry;" **Holleman**, "Organic Chemistry;" **Crookes**, "Chemical Analysis;" **Foster**, "Physiology;" **Wedl**, "Dental Pathology;" **Broomell**, "Anatomy and Histology of the Teeth;" E. C. **Kirk**, "Putrefaction;" **Tomes**, "Dental Anatomy;" **Sewill**, "Dental Surgery;" **Talbot**, *Dental Digest*, **Cosmos**, and *Journ. Amer. Med. Association;* **Black**, "Formation of Poisons;" **Klein**, "Micro-organisms;" **Cheyne**, "Antiseptic Surgery;" **Pasteur**—his Life; "Century Dictionary;" "Encyclopedia Britannica;" **Brunton**, "Lectures on Medicines."

Discussion.

Dr. Geo. W. Cook, Chicago, Ill. I did not hear the first part of the paper. As some of you may know, I have tried in a feeble way to do something in experimental work on this subject, and in this work am a little like the old German, who said in regard to reading the Bible, "The more I know about it, the more, by Geminy, I don't know about it." It is a subject that is always capable of being discussed in an intelligent way, but until we know more of the subject of physiological chemistry we will be as we are now, somewhat in the dark as to many of its phases, because of the fact that the cause of disorganization of the enamel tissue in one instance is different to that of another. We have the so-called pathological germs that produce the disease process in the tissue. The part of the subject that seems to me the most perplexing is that the acids form in the pulp or in the tissues, and until we know more of that we will not be able to destroy many of these germs as easily as we think. Many of these acids may enter into and become a part of a circumspect protection to the germ life itself. The substance that the essayist has passed around ("mono-chloroacetic acid") I have not tried, but from its chemistry, and in this form, I would say it ought to be an excellent agent. From the reaction that would take place, this agent ought to destroy the surroundings of the bacterial cell. We know that the ordinary antiseptics will not do this unless of such strength as to destroy the surrounding tissues, and thus they are not reliable for physiological reasons. We have been inclined to think that because an agent is irritating, and because if we put it on a rat's tail the rat will run away, giving evidences of pain, we can use it to kill microbes.

The things that we ordinarily regard as antiseptic are probably no more than food, or perhaps destroy the tissues in such a manner that the bacteria may enter in a more virulent way, producing worse diseases than those we originally attempted to treat. The protoplasmic cell is made up in such a way that it requires an agent that will destroy and enter that particular cell without destroying the tissue as well. Such would be a true antiseptic. Judging from the chemistry of this drug, it would be an ideal agent in a great many instances, but the feature arises that where we have a different cellular structure that we have what we say are pathogenic germs, which might require an entirely different agent to destroy them. The ideal antiseptic need never be looked for so long as we have such a variety of germs, because that which will destroy one will not enter another, and what will destroy germ life will, so far as we know at present, destroy the tissues more quickly than it will the lower vegetable life. The subject is a very interesting one. For instance, a review of the literature in the way he has brought it up is of great importance, because it leads directly to a line where one would be able to find the things he would like to look over and study, and make a comparative treatment if the case required. I appreciate very highly this excellent paper, and wish I could say something more directly germane to the subject.

Dr. L. E. Custer, Dayton, Ohio. I did not hear all of the paper, therefore do not feel qualified to speak, but was much pleased to hear this concise review of the subject as it was put before us by Dr. Harlan, who never does present anything that is not well worth our careful consideration.

Dr. C. H. **Oakman**, Detroit, Mich. I enjoyed the paper immensely. It is certainly comprehensive in every respect, both from a pathological and bacteriological standpoint. It is something we as dentists must ever bear in mind and look forward to, the time when we will have the proper antiseptics and disinfectants. In regard to the treatment of putrescent pulps, a gentleman today said he believed the only proper way to destroy bacterial life was by the use of formaldehyd gas. There is a gentleman in this room who is not a member of this society, and if it is your pleasure to have one who is not a member given the privilege of the floor, I would like to have him accorded that courtesy. I move that Dr. Lawrence of Kansas, be given the privilege of the floor.

The motion was supported and carried.

Dr. F. B. **Lawrence**, Eldorado, Kans. Two years ago I prepared a paper for one of our Western associations by request, which I based upon a paper written and read by Dr. Harlan in Europe, in which he criticized every method known, to me at least, for the treatment of dead or putrescent teeth. That he was groping in the dark was proved by the fact that he did not then—nor has he now—offered a specific. Allow me to quote a little from the paper presented by me two years ago, and re-read recently at the Oklahoma Dental Society: "Several years ago, following the discovery of formaldehyd gas, the dentists of the world endeavored to use that powerful germicide and antiseptic. We had no method by which it could be applied to the teeth in their normal condition. I remember distinctly one case that came to me; to quote the language of Dr. Harlan, when I opened the cavity I found 'a stench that was not primary.' It had been treated. I did my best to preserve the root of that upper canine, but the patient returned after the canal had been sealed, suffering with pericementitis, and in desperation I reached for a bottle of the preparation of 'polymerized formaldehyd'—formaldehyd gas in a solid form. I had attempted to use it in an aqueous solution in various strengths; in 39½ per cent. it could not be used, as it had an effect on the gum almost equal, if not worse, than arsenous acid. I attempted to use it in the gaseous form, but could not. I failed with it mixed with menstruums. The bottle I picked up was of solidified formaldehyd. I placed a piece of this solidified formaldehyd, approximately the size of a pinhead, in the bulbous portion of the canal, covered it with a pledget of cotton, and sealed with temporary stopping. I discovered then, and from subsequent experience, that in this form the heat of the body caused the polymerized formaldehyd to return to its gaseous state more slowly than the moist parts contiguous to the root could absorb and eliminate the same. I got very little, if any, irritation from its application in this form. In the beginning of my experiments I succeeded in getting it through the apex of the root, but only when used in paste form or the aqueous solution—formalin. In some cases several hours of continuous pain supervened, but at no time did it fail to subside, nor the tooth to be conserved. In all the cases I have undertaken—and I do not say it in the spirit of egotism, for some I have not undertaken—but of all I did undertake to save I have had but two fistulous openings, and these formed painlessly. The cause of our failures in attempting to use formaldehyd is that the heat of the body (in any of the forms in which we have applied it save in this polymerized form) causes the eliminating of the formaldehyd gas with greater rapidity than the moist parts surrounding the tooth can absorb and eliminate the same, hence the escharotic or toxic effect."

It is impossible for me to discuss as scientifically the operation of this solidified formaldehyd as Dr. Harlan has just discussed the value or lack of value of our antiseptics, but I hope that my several years' experience of the successful application of this antiseptic may be yours. This form of formaldehyd conforms to all of the demands made by Dr. Harlan for the qualifications necessary to a perfect dental antiseptic. It is the most penetrating antiseptic we have; it is soluble in water; it does not produce a coagulum, thereby shutting itself out; its toxic or escharotic effect when properly applied is *nil,* and pain seldom or never follows its application unless it be in dead teeth, in which the simple act of opening seems to arouse all the latent forces in or around the apical portion of the tooth, and where, in spite of application of all known antiseptics save this form of formaldehyd, pain continues for several days through the stages of the alveolar abscess to its complete resolution. In such cases the abnormal activity of the diseased germs inclosed secures the start of the formaldehyd, and as a result there is some pain and soreness, both of which invariably subside within a few hours, when the tooth is ready for its permanent filling. In these cases this is a specific. I hope many of you will try this preparation, and I hope to hear from you with reference to your success or failure with it.

Dr. F. W. Low, Buffalo, N. Y. The members of our New York State Dental Society received blanks, asking that they make a report at the next meeting upon the feasibility of the treatment recommended by Dr. Buckley, of which Dr. Harlan has spoken. When Dr. Buckley was with us at Albany he made the chemical equation on our blackboard, showing why the combination was beneficial. I have used it for five putrescent pulps, sealing it in with gutta-percha with no resultant pain, and believe it will control the tooth without pain in these emergency cases. I should be afraid of the method used by Dr. Lawrence, as I have had disagreeable effects with formaldehyd when used alone. If the paraform does not decompose and change to gas too rapidly, the tissues will perhaps tolerate it, but in some mouths I would be afraid it would change to the gaseous form so rapidly that it would force the gas through the apical foramen. It is not an antiseptic in the sense we use it. It will destroy germs, but it will destroy the tissues just as rapidly, and we must be cautious. I am one of those chemists who know so little I should have been afraid, had not Dr. Buckley showed the chemical equations to us, and his reputation is such that I felt disposed to take his findings upon trust. I desire now* to add that after some months' experience, I have never had occasion to regret having used this combination of formalin and tricresol.

Dr. Cook. The subject of paraform interests me. Some years ago, when it was first brought out, I was working in the bacteriological laboratory of Klebs. It is simple, and there are some beneficial things with reference to it. It is prepared by evaporation of formalin. It is the best thing I know of, but it must be heated. With reference to the irritating properties, for instance, the tooth is sealed tightly, and there is enough moisture to allow the resorption of that gelatin to release the gas. In the majority it is gradually given off under pressure. In the treatment of a tooth, anything that is liberated in the form of gas or moisture is ordinarily irritating, and more irritating under pressure than anything else, especially at the temperature of the mouth. The formaldehyd paraform may remain without a particle of the gas being liberated, but if you put that under pressure at the temperature of the mouth, you have another condition entirely, which depends on a great many factors that may enter into the liberation of the gas and consequent irritation. The main point in Dr. Lawrence's treatment is his manipulation of the substance, rather than the substance itself—the seeing that the tooth is dry and all that. Tricresol and formalin, I presume, are about as familiar as anything, and in most conditions the formalin is absorbed by the tricresol. It will go in about three per cent. When formalin is added the tricresol will take up a large quantity, and gives it off the same as it does the gelatin, depending on conditions largely; and if you have any irritation from it the antiseptic quality is due to the tricresol. I believe if the tricresol be used alternately and tab kept of the tricresol and formalin, comparing them, the results will be interesting.

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* October 1905. Date of correction of stenographer's notes.

Dr. LAWRENCE. I believe that the solidified formaldehyd and the paraform are different. In boiling formalin in a sand-bath you secure a white precipitate; this is the pure formaldehyd. You may use it in putrescent teeth in any form, and it is absolutely inert without the presence of moisture; hence do not dry said teeth. As I hope to demonstrate in my clinic, I give as thorough instrumentation as possible.

I use the form of formaldehyd that eliminates this gas very slightly. I do not dry the teeth but leave them moist, knowing positively that the formaldehyd gas will seek, as a ferret seeks its prey, through every crack and cranny, through the tubuli, to and beyond the cementum, thoroughly tanning the protoplasm of every pathogenic germ, and positively sealing the inclosed nuclei of the cell forever from proliferation. I have not been compelled to extract a single tooth that I have treated with this preparation, but there must be special attention given to its application, for as dynamite is to explosives, as cocain is to anesthetics, so is solidified formaldehyd to antiseptics. Its proper application will be as redolent with good results to our patients as the proper application of cocain has been. Allow me to congratulate Dr. Harlan on his excellent paper, and to say it is a pleasure to hear the truths dropping from his lips, in the discussion of which I know my inability.

Dr. HARLAN. The title of my paper was "A Review of the Question of the Treatment of Putrescence as Related to Pulps and Pulpless Teeth"—of what other people have said and done in their study of this subject. I found what I thought were some weak links in the chain of the treatment of putrescence, and the principal animal alkaloid, namely putrescin. That is soluble in distilled water. We could wash out the interior of the tooth first with distilled water, and get rid of most of the putrescin, and the reason I proposed the use of the mono-chloroacetic acid is that it is less irritating than some other things. When it comes in contact with H_2S and PH_3 it unites chemically, because it has a loose carbon atom, and is destroyed when you thoroughly saturate the putrescent mass or putrillage. Then you have accomplished the thing chemically. You can seal the tooth without danger of trouble. There are three cresols united in the formula of Dr. Buckley in the tricresol, which is soluble in water to a certain extent, and all three of them enter into what is known as lysol by the addition of soap. Dr. Buckley proposes to wash out the fatty acids resulting from the decomposition or putrefaction of the pulp; he proposes to separate the fat globules by the use of alcohol, and then with the cresol make soap of the fat, and get rid of it in that way, by disinfecting the putrid material in that form. This subject deserves the profoundest thought of our scholars, and we can only get that by a more complete study of what is known as physiological chemistry. Something more must be learned than we now know with reference to putrefaction. Nearly all the writers on the subject seem to feel that putrefaction and fermentation come under the same head. Anyone who has studied it will know that you have in the putrefaction of the animal matter in the pulp-chamber an alkaline condition to meet.

Dr. Hodgen gave us a paper with reference to the action of sodium dioxid on putrescent pulp, etc. I disagree with him in his conclusions. I have given credit to the different methods of the different writers fairly and distinctly, and I will state now, for the benefit of those who have not recently studied chemistry, that everything has been revolutionized in the last ten years, and you must throw away your old books. At the present moment the very best thing for treating a putrescent condition and putrescent material when accompanied by gases is an acid substance, not a basic acid itself, which will combine with this substance and render it inert, producing the best disinfection we have been able to discover up to this moment.

The meeting adjourned until Wednesday July 26, at 3 P.M.

WEDNESDAY—*Afternoon Session.*

The meeting was called to order by the chairman at 3 P.M.

Dr. ELI H. LONG, Buffalo, N. Y., then read a paper entitled "The Professional Man's Disease."

[This paper was published in full at page 125 of the February issue of the COSMOS.]

Discussion.

Dr. B. J. CIGRAND, Chicago, Ill. I feel that Dr. Long has given us a message that will mean much to many of us. I consider his labors in this direction of great value to each and every member present, and I am satisfied that when his paper is printed, and time be taken to carefully read and digest what he has given us, everyone will be satisfied in his own mind that it is one of the best papers, so far as the advice given is concerned, that has ever been read before the dental profession. I am satisfied that he has treated the subject in a scientific way, and has based what he has given us on the closest study of the subject. I realize every day that our profession is one of the most taxing. I doubt not that our labors act more severely upon the nervous system and circulatory system than any other labor the human being may engage in. The tedium of putting in a large gold filling, the removal of pulp in a molar tooth, and a great variety of labor that falls to us every day, is of such character as to exhaust the whole system, not merely the physical system, such exhaustion as is felt after running a race, nor the mental system, such as is experienced in studying, but the strain on both systems is such that we are both physically and mentally exhausted. I sometimes think our labor begets a peculiarly tired feeling not yet described in our latest dictionaries. We are all working too hard and too constantly. The doctor has brought us a message. He says, Stop, rest, recuperate, and live, and every one of us needs that edict given us, and we need some power stronger than ourselves to enforce it. I say to you, gentlemen, that the majority of the young men now practicing dentistry are laboring with more severity and more constancy than did the old practitioners. We are all confined in the office too closely. Our professional work greatly differs from that of the medical, legal, or kindred professions. That for which we receive compensation is done right in our office, and we are supposed to be paid only after we have delivered some form of goods or material. The lawyer and others may go out in the fresh air, and get recreation while doing their work; not so with ourselves. All this should be changed. We should be able to charge for our advice. Every day you are giving advice to your patients and not collecting one penny for it. The only time they care to pay us is when we have given them some metal, some earthly goods, and it belittles us.

Recently a judge in Oregon had the good sense to give a dentist the right to collect a small account of sixty-five dollars for advice he had given. I believe that is the first such verdict we have received in the courts. I believe that if patients come to you for advice, whether you make the appliance or not, they should pay for it. Who would think of going to a lawyer and telling his troubles and getting the lawyer's advice, and then go away saying, "I'll be in next week and make an appointment." I think a dentist should charge for advice just as honestly as a lawyer.

The idea that one never leave the office is a little severe on our profession. I myself believe in leaving the office any day and any time I feel severely tired. I have done this for years, but notify my patients of intended absence. No matter who the appointment is with, I do not believe in my practice ruling me. My health comes first, consequently I do not believe in letting my patients dictate to me what I should do for myself. When we are able to do this, we will hold our own and become a dignified profession.

It does not accrue wholly to ourselves when we rest. I hold that when we go out and seek recreation and rest we are not wholly selfish. If you take a week's rest it will be a good to the community in which you reside and practice. No man can practice dentistry in a careful, thorough way when he is tired, when his nerve energy is sapped out, when he is so thoroughly exhausted from his labors. When one has rested he comes back a new man, with renewed power to do the best for his patient. Such a one has the confidence of the patient, and does a great service to him, because one can operate with less strain on himself, and less on the part of the patient, in consequence of good health. The public will be the beneficiaries, and I welcome the day when we will not always be expected to deliver material goods, but can feel we may charge for advice given, and receive such remuneration in return as will allow us to go out into the woods and commune with nature. "In journeying through life, let us live by the way," is both poetic and sensible. Let us take this message, work less, charge more, and live better.

Dr. N. S. **Hoff**, Ann Arbor, Mich. I was interested to note the differentiation made especially in regard to considering uric acid conditions as a result of auto-infection. I think this is especially valuable information, for it will not only lead us to treat this condition more intelligently and satisfactorily, but will enable us to take better care of ourselves in the line which the last speaker has indicated. I know that we dentists do not take proper care of ourselves, and as the essayist read his paper and as I listened to Dr. Cigrand's remarks, it occurred to me that we are making a mistake in allowing ourselves to get into such a condition that we require such extreme measures to keep our bodies in proper working order.

Recently we have heard a good deal said about the suggestion made by Dr. Osler, that at sixty years of age a man's life is practically ended, and he might as well be chloroformed. I have seen many men whose work should not terminate at that age. If it is true that at the age of forty-five we begin to degenerate, is it not time for us to understand this matter more than we do, and take more care to maintain our bodies in more perfect condition?

Not all of us can adopt the excellent *régime* of exercise prescribed. It is inconvenient, and requires time and self-denial and all that sort of thing. Would it not be much better for us to take some precautions that would render it unnecessary to do this sort of thing in order to keep our bodies in the proper condition? I have believed for a long time that dentists abuse themselves in the matter of eating, as we eat too much for the kind of exercise we have. We must do our work in the house, or in the office, under conditions that we cannot change very easily. We can change our diet, if we cannot secure sufficient oxidation to assimilate the food we provide. Is it not time for us to determine what food we require, its character and the quantity? I have been in the habit, and most of you have, I presume, of eating a hearty dinner in the middle of the day, and I find that I do not return to my work with energy and enthusiasm. I feel more like taking a nap than going to the chair, but my patients will not wait for me. We resume work too soon after eating a hearty meal, and bending over the chair in the positions required by our work, we make it practically impossible for the digestive organs to take care of the meal we have eaten. The food remains in the digestive tract undigested, to undergo fermentation with its toxic result. Is it not possible to change our *régime* to two meals a day at such times as shall provide an opportunity for digesting and assimilating them, rather than at a time when it is impossible for us to do this? It seems to me this should be an easy matter to control.

It may be impracticable for us to change our habits of work, but we can change our habits of living, and it is incumbent upon us all to do so. We have need not only to adopt the method recommended by the essayist for taking care of our bodies after they are in this debilitated condition, but also to secure better ventilation in our offices. Many have offices in large cities, and small operating rooms with a limited amount of fresh air, which should have the air changed frequently. I am very glad to have heard the paper, and as Dr. Cigrand has said, I want time to read it over and to think about it.

Dr. Logan here took the chair.

Dr. J. D. **Patterson**, Kansas City, Mo. I have nothing particular to add to what has been already said. I am convinced of the great importance of all this, because I have seen so many who have fallen by the wayside on account of too diligent attention to business and too long office hours. It is unquestionably a fact, which he states so succinctly, that it brings about the conditions he refers to in his paper, and we should all take it to heart as a practical lesson. Like many others, I consider myself so strong that nothing can tire me to such an extent as to bring about these conditions; but as the hours, months, and years go on, we find insidious inroads upon the strongest constitution by the methods of living which he has spoken of, and which will, with the best and strongest, bring about disease, unless we compel ourselves to take exercise in pure, fresh air. This we must do, in order to keep up a proper physical condition.

Dr. **Long** (closing the discussion). I want to say that my paper had the merit of presenting nothing new, but simply emphasizing some essentials not sufficiently appreciated by professional men. I think of but one point to which I wish to reply, namely, regarding intervals of meals. Of course that should be according to a man's activity. I presume a man working hard at active physical labor cannot well pass the dinner hour without a good meal, but it seems to me very unphysiological for a dentist, physician, or any professional man to eat a heavy meal and return immediately to work. If one will substitute a bowl of soup, a cup of coffee, and possibly a light dessert, he will feel better for it and not have that feeling of indisposition to which Dr. Hoff referred. It seems to me more physiological to take the two solid meals morning and evening, with something like equal intervals of time between.

I desire to express the feeling that it might be of benefit both to medical and dental circles to occasionally interchange our papers. I was much impressed in listening to Dr. Cigrand's paper on mastication. I would be glad if physicians could hear that paper, as they do not concern themselves enough with that subject.

The next order of business was the reading of a paper by Dr. F. W. **Knowlton**, Akron, Ohio, entitled "The Possibilities of Modern Dentistry."

[This paper is printed in full at page 419 of the present issue of the Cosmos.]

Discussion.

Dr. H. L. **Wheeler**, New York, N. Y. I notice one place in the gentleman's paper where he spoke of the necessity of extracting something over one hundred and fifty teeth. He neglected to state whether they were deciduous or permanent teeth.

Dr. **Knowlton**. Mostly permanent.

Dr. **Wheeler**. What was the occasion of extracting such a large number?

Dr. **Knowlton**. Roots were badly abscessed. Such people cannot afford to pay for having the teeth treated successfully in a good many cases.

Dr. **Wheeler**. I am not prepared to criticize the doctor's position, but if I had one hundred and fifty teeth to extract in five or ten years, I should think I was doing a great deal of damage. It seems to me the first step toward preserving the utility of the mouth is to keep the teeth in place, and if the patient can afford the time, no matter how badly abscessed, I do not remember having seen for a long time a tooth that could not be made to do service for some little time longer than when the patient presented.

Dr. L. G. **Noel**, Nashville, Tenn. I did not hear the title of the paper, but some of it impressed me with the truth of the statement that we do not talk to our patients enough about the importance of oral prophylaxis—the possibility of auto-infection from uncleanliness in the mouth. I believe we overlook the advantages that come to us as dentists, of laying the importance of these matters before our patients, and impressing them with it. I think if we dentists would follow up the opportunities we have when the patient is in the chair, and we are thus able to talk to them, it would redound greatly to our credit, and be a professional advantage.

Dr. KNOWLTON (closing the discussion). I do not know that there is much to say. The number of extractions has been necessary, as I stated in the paper, on account of the nature of my work, more than is ordinarily necessary in practice, as I am dental examiner for the Diamond Match Company, and I examine the mouths of all the employees in that company in all their factories in this country. I do not do any of the work necessary myself.

Dr. WHEELER. The figures were not from your private practice?

Dr. KNOWLTON. I am not in private practice now; I look over all the employees in these factories every two to three months, and keep a record of each case, and necessarily they have to go and have the work done by other dentists. Many of the teeth I mark for extraction might be treated and made good teeth if the dentist would treat them. But if I marked on the slip first to go and have it treated and afterward it was extracted, there would be trouble. I find it necessary to do it the other way. A great many I have marked for extraction have been treated and saved. If you will realize that this is only among thirty-six thousand examinations, you will see it but demonstrates the importance of dentistry, and the high prophylaxis that is being advocated at present. The masses do not get into the dental office. One man says ten per cent.; it is not much more than that, if it be that. My examinations include many pupils out of the public schools on their vacations, and the young are following in the footsteps of their parents.

I want to thank the chairman and those assisting him for the courtesies extended.

On motion the meeting adjourned until 8 P.M.

WEDNESDAY—*Evening Session.*

The meeting was called to order Wednesday evening, July 26, at 8 P.M., by the acting chairman, Dr. W. H. G. Logan.

The first order of business was the reading of a paper by Dr. HERBERT L. WHEELER, New York, on "Some Observations upon the Obscure Etiology of Pyorrhea Alveolaris," as follows:

SOME OBSERVATIONS UPON THE OBSCURE ETIOLOGY OF PYORRHEA ALVEOLARIS.

In observing the various phases of pathological conditions exhibited in the disease which results in the destruction of the supporting alveolar wall of bone about the teeth in the human jaw, it has occurred to the writer that while local treatment is almost always beneficial and often curative, it is not invariably so.

This may be because the underlying causes are not primarily local, but are results of conditions the beginning of which extends back to the dawn of human existence.

From the various forms, such as local irritation caused by a deposit of calculi in a few places up to that condition of calcareous material which occurs well up under the free margin of the gingiva and causes a general irritation, there is produced a variety of pathological conditions. These are the congestion of the soft parts and the disintegration and destruction of the underlying bone, producing waste material that invites the presence and multiplication of pus bacilli, or those disagreeable, infectious, and infected pus pockets known as pyorrhea alveolaris, which are followed by the loosening of the teeth and recession of the gums.

It seems possible that these various steps of disease and destruction may have their origin assigned to the time when primitive man began to experience the vicissitudes of an ever-changing environment. This mutation has finally grown to the conditions of our present high form of civilization.

With this thought as an incentive, I was induced for purposes of comparison to undertake the examination of the jaws and teeth of the large number of prehistoric American and other skulls to be found in the American Museum of Natural History, New York city, and also some in Peabody Museum at Harvard College.

Thus far I have examined carefully more than fifteen hundred skulls, and find conditions that are a surprise to me. I cannot do better than to give you a record as I took it down at the time of examination.

The first lot comprised some ninety-two skulls known as Jaliscos and Huicholes, Mexico; of this number only eleven showed any signs of alveolar destruction such as occur in the cases of pyorrhea alveolaris, and the destruction in most or all the cases was due primarily to an alveolar abscess which had apparently been caused by a diseased pulp. As to accumulation of calculi I shall speak later.

The next lot, from the Cave Valley mines, Chihuahua, Mexico, comprised some fifty-six skulls of which the alveolus of six had been destroyed, this process in each instance being caused, as in the cases before mentioned, by alveolar abscess.

The next lot were more numerous and comprised Chihuahua, Tarahumar, the Valley of Mexico, the Mechoacan Tarasco and Otomie—altogether some two hundred and seventy-two skulls; of these forty-seven had well-defined marks of alveolar destruction around certain teeth. and in all instances the evidence indicated that they were caused by alveolar abscess.

These are about all the Mexican skulls examined. When I describe them as prehistoric, this means in the sense that they are the remains of a people who inhabited the region from which they came previous to the coming of Europeans. How long they antedate this period is not known.

The next lot were of Peruvians, and were secured and brought to the museum by Professor Bandolier. There were seven hundred and twenty-one of these. One hundred and sixty-six gave evidence of alveolar destruction.

There were many curious abnormalities in these jaws, and conditions which might indicate a more advanced civilization than in the case of the Mexicans, but the general cause of alveolar destruction in these as well as in the others seemed to be abscess conditions.

In the territory now comprised in the United States the most ancient skulls were possibly those from Santa Catalina, southern California. Of these there were fifty-six. Fourteen showed evidence of alveolar destruction, the cause apparently being the same, viz, alveolar abscess. These skulls I found in the Peabody Museum of Harvard University.

Of great age also are the skulls of the Cliff-dwellers of southeastern Utah. There were seventy-two of these, and only four showed any evidence whatever of destruction of the alveolar process, these also being caused by a destroyed pulp and abscess following.

There were a few scattered ones from South America; five Amazonas from Peru; three of which were affected, and four from Patagonia and Tierra del Fuego, one of these four being affected.

From the northwestern portion of the United States and British Columbia there were a large number—one hundred and sixty-two, of which fifty-nine showed destruction of the alveolar process, and these cases were largely due to alveolar abscess; but in some cases syphilitic lesions seem to have been the cause.

From the southwestern portion of the United States there were skulls of the Pueblos of New Mexico, of which I examined twenty-one, only three of which showed any destruction of the process.

From White River, Arizona, there were the skulls of some Apaches, Anatobes, etc., eight in number, two of which showed destruction of the alveolar process. From the general appearance I think that both these and the skulls from the northwest are of a later date than the Mexican, Peruvian, Santa Catalina, and southeastern Utah skulls.

From Siberia there were sixty-six Eskimo skulls examined, and twenty of these showed destruction of the alveolar process.

There were fifty-seven unclassified skulls, twenty-five of which showed the process more or less affected. Whether these latter skulls were modern or ancient I do not know.

Now, the thing that surprised me most was to find calcic deposit about the necks of the teeth in a large majority of cases, but rarely had it produced much effect except to cause a slight receding of the alveolar border and a slight thickening of the bone.

With the exception of a very few cases in these fifteen hundred skulls the destruction of the process in any such way as the disease of pyorrhea is known to destroy it was plainly due to alveolar abscess caused by pulp trouble, and this was to be found almost universally in those of advanced years and came about in this manner: The teeth gradually became worn down owing to the harshness of and the grit in the meal and cereals used by these people, this food material being probably ground by the primitive method between stones; and finally, after the wear had become so great that for some reason the pulp was no longer able to protect itself from irritation and infection, it succumbed to the inevitable, decomposed, and caused an abscess which usually resulted in a greater or less destruction of the alveolar plate in the vicinity of the disease.

It was remarkable, though, how the tendency of the pulp, in these people of long ago, was to protect itself; the common condition is to find whole sets of teeth with the pulp-cavity well defined because of the deposition of secondary dentin.

If you will notice, the proportion of those that suffer from destruction of alveolar tissue is greater as the remains represent more modern times.

Pyorrhea alveolaris is such a misleading term that I hesitate to use it, as it implies a pus condition which is by no means always present during the destructive process; and interstitial gingivitis is quite as misleading, as it implies an inflammation of the gingiva between the teeth, which is not always present.

Some of the most obstinate and incurable cases that I have ever treated did not have pus in quantities large enough to discover it, and instead of there being an inflammation the condition was anemic, even the gingival margins being almost white; but the teeth were loose and the supporting process was undergoing rapid disintegration.

As the term pyorrhea alveolaris is the one most generally understood I shall use that term, and by it designate those conditions in which the destruction of the alveolar process is taking place, either in isolated places or over the whole surface, regardless of whether there are pus conditions or not.

It is apparent to one who has observed this condition carefully that what occurs in the progress of the disease is not primarily a receding of the gums, as is universally inferred from the language used in describing this condition, but the destruction in some way of the underlying alveolar plate of bone; and the settling down of the soft tissues, as their support is withdrawn through the loss of the bone underneath, causes the apparent recession.

Now, just what takes place in this destructive process I do not know, and I know of no one who has satisfactorily described it. It seems to me, though, that there are underlying reasons why this disease is becoming more and more common, and my observations upon the skulls I have described have suggested to me some things that I have not found mentioned by other writers.

It is now generally conceded that the progress of the human race from the simpler to the more complex form of living is marked by progressive modifications and differentiations, so that as the changed conditions or environments occur, certain organs may become less and less used and others may be used to an exaggerated degree. Now, the organs not used are gradually suppressed or atrophied, while those that are becoming more useful are developed in an increased degree. This is due to inheritance and the propagation of those peculiarities that contribute most to continued life in the struggle for existence.

The human race is just as subservient to these laws of evolution as any other animal, and the environment of man and conditions under which he exists have changed more rapidly than those of any other animal, owing to his having arrived at a state where he has succeeded in recording his experiences and transmitting information for the benefit of generations to come.

This has resulted in a desire on his part to give more time to the development of the mental and less to the acquisition of aids to merely physical existence. This means decreased physical energy in some ways and parts, especially in the matter of mastication, while increased knowledge has been used to help in the preliminary preparation of food for purposes of nourishment. Thus it is the kitchen and its equipments have softened the fibrous and tough meat used by primitive man and rendered more pulpy the starchy cereals, and nature, ever trying to adjust herself to circumstances, refrains from producing the energy originally necessary to accomplish by mastication what is now done mechanically and chemically.

This, I apprehend, is the reason why the calcareous matter deposited upon the teeth of ancient man was less destructive than at present. The food of those times was hard, tough, and fibrous, and required time and energy to prepare it for swallowing. Now, through the assistance of the culinary department and of proprietary and special forms of manufacture—as is evidenced by the great variety of breakfast foods—there is not material taken into the mouth to continue the stimulating and toning effect that the mechanical friction of fibrous and hard foods produced, and the tissues have lost their tone; and thus, those conditions under which the alveolar process was developed not continuing to obtain, the process of elimination is gradually asserting itself. This, then, is the condition we have to combat, but do not imagine an abrupt return to remote conditions would necessarily remedy the difficulty. Much modification has taken place since the cook-stove was originally used, and we should find an immediate return to early conditions as disastrous as the present apparent developing of a condition in which teeth will no longer be needed.

Of course there are details in the progress of this disease which are to be considered. The unnecessary extraction of teeth may bring an extra strain upon tissues already weakened by comparative disuse, and so cause a predisposition to the trouble. People may—in addition to their inability to supply fibrous matter in order that there may be friction in the masticating process—neglect to make some small amends by the judicious use of the tooth-brush on both teeth and gums. Bacilli may contribute to the trouble, but as micro-organisms have existed from the beginning, and as the price of the continued existence of a species is adaptation to its surroundings, I believe that under ordinary circumstances bacilli are harmless and are incapable of gaining a foothold until the vitality of a part by abuse or lack of use is so lowered that the ordinary resisting powers do not obtain. This does not apply to calcified tissues, and it seems to me that the highly accelerated rate of change in our environment, prohibiting nature from adjusting herself to the new conditions is very largely responsible for the large increase in the troubles known as gouty and rheumatic, which are largely due to faulty metabolism.

This does not necessarily mean that the trouble is entirely local and caused by lack of the severe conditions under which these tissues were developed, for an inability to properly utilize and assimilate food in the stomach and intestines may also bring about conditions that contribute to the early destruction of an organ that is in the process of being rendered useless by lack of use, so that while the final destruction of the alveolar process may be a thing that threatens us, a faulty condition of nourishment may greatly accelerate this undesirable climax. Under the circumstances it would seem that if the conditions in the mouth could be kept similar to those conditions under which the hard and soft tissues have developed in the formative process, the ravages of not only pyorrhea but caries of the teeth would be greatly retarded.

Discussion.

Dr. C. O. Kimball, New York, N.Y. To discuss this subject properly requires much preliminary study, and few of us have had the opportunity of looking over these thousand or more skulls which Dr. Wheeler has investigated. In his conclusions he says that pyorrhea depends upon the destruction of the alveolus. It seems to me that this destruction in the case of pyorrhea is along radical lines, starting at one point of the gum margin. It does not tend as a rule to follow around the tooth, but it proceeds in more or less direct lines to the apex of the root. Frequently underneath the gum there is a deep pocket, where the pericemental membrane has been disturbed, absorbed, and destroyed, the attachment of the tooth being of course gone; but it is not my observation that the alveolus is gone. What evidence did Dr. Wheeler find in these skulls which led him to differentiate so clearly between pyorrhea and abscess?

Dr. F. L. Fossume, New York, N.Y. I regret very much that I did not come in time to hear all of this paper, which I have been waiting for. The obscure etiology of pyorrhea alveolaris is a subject which, if we study more carefully into the condition of the general health of the patient, as Dr. Wheeler has so clearly made us understand, would become clear, and we should be better fitted to treat cases coming under our care. The etiology of these true cases of pyorrhea alveolaris is really very obscure and deep-seated, and I believe of many years' standing. For this reason it is necessary to find the ways in which the patient has violated the laws of hygiene or nutrition. I have known cases where a cure of pyorrhea alveolaris has been made merely through a change of diet and change of living. I have in mind a lady who was feeding on carbohydrates, or an excessive amount of carbonaceous foods in excess of nitrates, which I believe was possibly the cause of the condition of the mouth. It depends on the vitality of the gums and parts about the teeth and their roots. This patient's diet was changed from white to whole wheat bread, and deprived of buckwheat cakes and syrup, more wholesome and concentrated foods were given, such as nuts and the whole wheat, which can be easily obtained. After three years of careful attention to diet there is no indication of pyorrhea in this patient's mouth, the teeth being firm, the gums hard and tight, and the health improved so greatly that instead of going abroad every year, as previously, the patient is living in New York today and engaged in business, although past sixty years of age. As said before it is necessary to look back into the patient's life to treat a case of pyorrhea alveolaris. I believe it is often found that some one of the internal vital organs, as the kidneys, the heart and the corresponding circulation, is the true cause of the trouble, and for these causes specific treatment should be applied in conjunction with the medical practitioner. In many cases we can diagnose the first stages of Bright's disease and diabetes from the condition of the mouth, and the patient has been put on a careful diet, flushing the colon and drinking large quantities of pure spring water, excluding the red meats and heavy foods in order to improve them physically; thus the condition of pyorrhea alveolaris has been done away with, of course in conjunction with local treatment. I think we should all be grateful to Dr. Wheeler for the magnificent exhibition which he has given us, and for the benefit we will derive from his researches.

Dr. M. Albrecht, Indianapolis, Ind. I think in the future we will have fewer cases of pyorrhea alveolaris than we have had in the past, because more cases are presented to the dentist for treatment than there were twenty-five years ago. The dentists know something about the teeth, and about the best thing we do know is that "cleanliness is next to godliness." We should take care of the incipient stage—the beginning of pyorrhea. Cleanliness is not practiced as much as I would like to see it, and this I know from personal experience, as patients come to me that have been to other dentists, and I find these calcareous deposits permitted to remain around the tooth, the result of neglect on the part of these dentists. The cases which are most desperate are the long-standing ones which have taken ten years or more to develop. I think they will grow fewer in number in the future. We now have about forty thousand dentists in the United States, and I believe cleanliness will be observed more in proportion as the public becomes better educated by the profession.

Dr. WHEELER. I did not intend to infer that the first symptom of the pyorrheal condition was the destruction horizontally of the alveolus as it surrounds the tooth. I am glad Dr. Kimball called attention to the fact that I had not made that claim. In nearly all cases the destruction of the bone is perpendicular in a narrow and circumscribed space, which is the chief way I had of discriminating between true pyorrheal destruction and that brought about by alveolar abscess, in the skulls I examined. The ends of the roots showed plainly that they had been bathed in pus. The parts surrounding had round holes in the outer plates of the bone and were little destroyed at the margin, which was evidence that it was not pyorrhea, but that it came from destruction of the pulp of the tooth. It is not impossible to my mind that the peridental membrane may be destroyed first. It may occur under the margin, but the bone begins to disintegrate, which would account for the condition Dr. Kimball speaks of. I think there are more explanations of this disease than we have any idea of. I do not believe it always occurs along the same identical lines.

Dr. J. P. CORLEY, Greensboro, Ala. We see a destruction where the gingival margin is intact, the part that surrounds the cervical aspect of the tooth, whose function it is to keep the tooth-neck clean from deposits. Is it ever the case that we have an actual sloughing of the alveolus before the complete destruction at the immediate point of this gingival margin?

Dr. WHEELER. What makes you think you have a sloughing?

Dr. CORLEY. By its evident dissolution.

Dr. WHEELER. Probably not, although you may have. My observation would lead one to think you have sloughing on one side and it remains comparatively clean on the other. The gingival margin that immediately surrounds the tooth may be seriously affected, but not necessarily destroyed.

The section then adjourned *sine die.*

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Monthly Meeting, November 1905.

A REGULAR monthly meeting of the First District Dental Society of the State of New York, was held on Tuesday evening, November 14, 1905, at the Academy of Medicine, No. 17 West Forty-third street, New York city, with the president, Dr. Arthur L. Swift, in the chair.

The president introduced the essayist of the evening, Dr. W. B. DILLS of Brooklyn, who read the following paper:

Past, Present, and Future of Porcelain in Dentistry.

In selecting the title for this discourse I was prompted by a desire to call to your mind some of the things that have been done in the past, for a better understanding of the present and a possible conception of what the future may bring forth.

As it was in the beginning, so it will be in the end with all conscientious practitioners—a desire for the ideal filling material. What this ideal is, remains to be proved, and I am going to quote from the book of no less an authority than Prof. Miller of Berlin: (1) Sufficient strength, that it may never break nor wear away under the stress of mastication. (2) Chemical indestructibility, that it may remain unaffected by the fluids of the mouth, or by any food or drink. (3) Permanence of form and volume in the mouth. (4) Thermal non-conductivity, that changes of temperature in the mouth may not be conveyed to the pulp. (5) A high degree of adaptability, that it may be made to fit the walls of the cavity so closely as to exclude moisture. (6) Color resembling as nearly as possible the color of the tooth to be filled. (7) Absence of every quality injurious to the substance of the tooth, including the pulp, or to the mucous membrane, or to the general health of the patient. (8) Ease of insertion. (9) The least possible susceptibility to moisture.

(1) In analysis of the above, I fail to find the one vital qualification of an ideal filling, namely, positive adhesive properties for the support and protection of thin walls. This applies to the strength and wear of a material which might under certain conditions be most admirable, while under other circumstances, such, for instance, as the dissolution of a major part of a molar, a foundation would be left upon which a material of such qualifications would be wholly inadequate.

(2) Chemical indestructibility. There is no question but that we have at our hands material of this character, such as gold, amalgam, and gutta-percha.

(3) Permanence of form, volume, etc. The first two materials, gold and amalgam, possess all the qualifications required.

(4) Thermal non-conductivity. Eliminates the two former from the category of ideal filling materials.

(5) A high degree of adaptability. There is probably no material known to the dental profession today that will so closely adapt itself to the walls of the cavity as the oxyphosphate cement, but unfortunately this is one of the substances which is easily affected by the mouth-secretions, and we must therefore eliminate it from the list of ideal filling materials.

(6) This brings us to one of the most important points in favor of the material to which I am going to call your attention this evening, leaving the deduction of its virtues until later.

(7) Absence of every quality injurious to the substance of the tooth, including the pulp, to the mucous membrane, or to the general health of the patient.

(8) We have in the fifth deduction a material which up to the present comes nearer to the qualifications than any thing with which I am familiar, and in the eighth it is equally indicated, but unfortunately it is extremely deficient.

(9) Under the head of the ninth consideration, I wish to qualify this by considering the conditions under which it is inserted, which will be explained later.

Walter W. Bruck, D.D.S., demonstrator in the Dental Institute of the Royal University of Breslau, says in his work on the filling of teeth with porcelain: "On account of its durability gold must always stand in the first rank." While not depreciating the value of gold, I must take exception to this statement, because of the fact that gold is dependent upon conditions suitable for its maintenance, having little or no value otherwise as a filling material. In other words a tooth to be preserved by a gold filling must possess sufficient strength of walls for proper cavity formation and the retention of the filling, and in no instance that I can conceive would gold as a filling hold the tooth together; the tooth must always support the filling. This is contrary to the virtues of porcelain, or plainer still, the zinc phosphate cement.

In the latter material, we have one which we all recognize as the best preserver of tooth-substance, regardless of fragile walls or otherwise, when it is protected from the chemical action of the fluids of the mouth, which up to the present is only accomplished by the so-called porcelain inlay or filling.

Thus it would seem that the ideal filling must be a combination of materials, and I know of nothing that comes so near the solution of the problem as a combination of Harvard cement and Jenkins' low-fusing porcelain.

Let us go back to the earlier dental history and we will find that the first great friend of the young practitioner was amalgam. This material has been the means of supporting more beginners in the practice of dentistry than any other of which I know. It will give better results, stand more abuse, and prove a friend to the beginner and inexperienced operator. To go into detail for the reason of such a statement would necessitate a paper in itself, therefore I leave it for your own deduction, and am sure it will take you but a few moments to sustain me.

Notwithstanding the foregoing conclusion, however, it is beyond question that it is the virtue of gold foil which has made American dentistry what it is today. Gold is the keystone to the arch of the tabernacle of our profession, and the inherent manipulative ability of the American dentist has placed him upon a throne which I hope will never be destroyed. Thus we see that we have in the past a record which would warrant us in assuming to master the problem of the present, namely, that of the "ideal filling."

Reverting to the history of dentistry, I find that in 1820 Dr. C. J. Linderer used the teeth of animals, shaped to fit the cavity, but it was found that after a while the fillings would become discolored. Next following was Dr. Murphy of London, who in 1837 used glass for the labial surface of teeth; but it was not until 1857 that Dr. A. J. Volck used pieces of porcelain, ground to fit the cavity. Following were Drs. B. Wood in 1862 and E. A. Starr in 1870, who had pieces of porcelain prepared with platinum pins fused in, and also Dr. Weagant, who devised instruments to cut out porcelain, and instruments of corresponding size to cut the cavity. In 1882 Herbst and others—whom I will not stop to name—brought out a new glass inlay, the defects of which I will not describe. It was not until 1885 that Dr. C. H. Land of Detroit marked a great era in porcelain fillings, by the burnishing of a metal matrix and baking the porcelain therein. Thus we see that even in the early days, there was a very marked effort to substitute something less conspicuous than gold; more from an esthetic point of view, than that of a time-preservant of carious teeth. But this is a thing of the past, and we have now to deal with the present, and if possible to adopt some method of practice with materials which will not only preserve the teeth, but at the same time will restore their appearance to a life-like and natural condition; and it is in this connection I want to bring to your notice this evening some of the possibilities in the use of zinc phosphate and porcelain as the modern and scientific method to that end.

First let us consider the various methods by which fillings of the above named materials are practically obtained. Dr. Jenkins, to whom we all should bow in reverence, advocates the burnishing of gold foil into the cavity to form a matrix, in which the porcelain may be fused to make it conform so closely to the shape of the cavity that it serves as a perfect seal or cover for the zinc phosphate, which is the true filling. At the same time the porcelain serves to hide the opacity and unlifelike appearance of the zinc phosphate, and restores the tooth in appearance to nearly what it was before the ravages of decay had attacked it and ruined its beauty.

Very excellent results may be obtained by this method of preparing the matrix, when conditions are favorable, but unfortunately conditions are quite as often unfavorable. Take, for instance, a cavity on the labial surfaces of any of the six anterior teeth, well under the gum line. To obtain a perfect matrix after this method, it is necessary to insert compressors for retraction of the gum tissue, which means in many cases several sittings at from two to three days' interval, and even then it is not unfrequent to have extreme difficulty in accomplishing anything like satisfactory results. But this operation can be made extremely simple by following the methods of Dr. Taggart of Chicago, first brought to my notice by my father-in-law, Dr. Van Woert, who visited that city last winter for the purpose of imbibing some of the many good methods and theories of such men as Drs. Taggart, Goslee, Johnson, Nyman, and others. Upon his return, the result was a complete revolution of our method of porcelain work. What seemed impossible before became simple matter for execution, such as the making of porcelain fillings from impressions, for which we are indebted to Dr. Taggart; the hand-carved crown, with many thanks to Dr. Goslee; and many other valuable points delineated by Drs. Nyman, Johnson, and others.

It is here that I can best describe Dr. Taggart's method of making porcelain fillings from impressions. We had tried many times in our practice to procure an impression by which we could reproduce the exact shape and outline of the cavity, but until we learned of the Detroit modeling compound, which Dr. Taggart recommends, the result was always a dismal failure. This composition possesses qualities second to none, so far as I am aware. It softens at less temperature, hardens very rapidly, and when properly manipulated gives a perfectly sharp detail of such small matters as scratches, indentations, etc. Further, the time required for its setting is so short that the operator is not required to long maintain a fixed position, cramping hand and arm. This makes possible the taking of an impression in a location and space otherwise impracticable—for instance, the approximal surface of the bicuspid and molar, the posterior approximal surface of the second molar, and anterior approximal surface of the third molar—besides which, the amount of space required for the same is little, if any, more than that for a perfect gold filling.

We have found that from platinoid No. 30 gage a most excellent cup or form for the retention of the impression material can be made. It can be easily cut to shape with an ordinary pair of scissors, and bent so as to conform to the contour of the particular requirements. The compound is rolled in pencil or stick form, which permits of cutting after slight warming. The platinoid having been cut and bent, it should be heated in the alcohol flame so that the required amount of compound may be made to adhere perfectly to its surface.

When such cases have been protected by the dam, and the cavity has been prepared with a suitable draft and coated with a thin vaselin, the cup and compound may be inserted with perfect assurance that after its solidification it may be removed without danger of distortion.

Having secured an accurate impression in this way, it is invested in plaster, and the surfaces exposed, so that amalgam may be packed and burnished into the mold, giving as the result a practically perfect reproduction of the cavity. This amalgam die is embedded in a composition called "dental lac," contained in one of the cups which belong to the Brewster so-called water press. And for a more perfect understanding of this instrument, I append the following description: (1) The press consists of a base with suitable arm support, for the maintenance of a screw, which is controlled by a lever. (2) A steel cup or socket, retained in the base by means of a square lug held in position by a slot or groove in the base directly beneath the point of the screw, and the inner cup, containing the dental lac and amalgam die, are placed in position. After having adjusted a suitable piece of Crescent foil No. 30 over the surface of the amalgam die, then a rubber plunger, which is hollow, or partially filled with water, is placed upon the die and foil, and forced into all spaces with a steel plunger, which fits the lower socket, so that when the screw above is forced by means of the lever, it drives the steel plunger before mentioned, together with the rubber water-bag or plunger, into all the interstices of the amalgam reproduction of the cavity, and as the result we have a matrix of gold which is free from any possible spring or warpage, and into which the porcelain may be fused, with a fair assurance that it will produce a seal for the zinc phosphate more nearly perfect than it is possible to obtain by any other method.

The above may appear a little intricate, as all written descriptions seem to be, but one demonstration would be sufficient to convince you that it is by far the simplest and most practical which we have at our command today. Further, there is one very marked advantage to be claimed for this method, namely, that of being able to make a number of inlays or fillings when the color problem is so important that the least variation in shade would cause a failure of what would otherwise be a most successful operation. It is to be regretted that it is necessary to go into so much detail in explaining this method, but there seems no other way by which I may impress upon you the many advantages of very marked value as are to be derived from it. And here let me say that, above all things, this method is applicable to the use of either the high- or the low-fusing porcelain.

We have with us this evening one of the pioneers and strong advocates of high-fusing porcelain, who is to participate in the discussion of this paper. I sincerely hope that he may find in this description something that will lighten his labors, and relieve his patient of unnecessary strain, so that he will exclaim, as we do, "God bless you, Dr. Taggart!"

There are a number of methods for making porcelain fillings from an impression, all of which I have carefully tried, but this seems the nearest to an ideal, and I do not propose to weary you with a delineation of such as I consider inferior to the above. It is enough for the present, at least, to know that I can produce a porcelain filling, with comparatively little fatigue to the patient or myself, and in comparatively as short a time, as by any other method known.

This, gentlemen, is the *present,* and if we now make zinc phosphate and porcelain the nearest to an ideal filling, regardless of location, for the human teeth, yet from a survey of the past and the accomplishment of science, I am strongly of the belief that while we have attained what seems to be the goal sought for, there are great possibilities for a more perfect perfection, for the substitution of something which will come to us, to make us believe that the millennium has come.

In conclusion, I want it distinctly understood that I do not depreciate the value of the various materials which have been the means of preserving teeth for so many years, and I bow in reverence to King Gold and Queen Amalgam for the noble work they have done in the salvation of teeth, and the distinguishment of the American dentist. I beg you will accept my sincere thanks for your kind attention, and if this, my first effort, shall bring forth a discussion which will lead us nearer the ideal filling, I assure you I shall have been more than repaid for my efforts.

Discussion.

Dr. JOSEPH HEAD, Philadelphia. We must acknowledge the fact that we have no ideal filling. Each one possesses one or two attributes that partially approach the ideal, but the nearest approach—barring color—is in my opinion a gold filling placed on top of soft zinc oxyphosphate. In that way it is made adhesive. We thus get maximum filling strength and adhesion, and all the advantages, barring color, of a porcelain filling, without the general risk of fracture, which is our chief bugbear. When we look back and see how we have hammered in gold on tooth-structure, and nine times out of ten left microscopic nicks in the edges for the bacteria to get in and start decay, it is monstrous to think of the crudity of the old method, and surprising that such fillings should have lasted as long as they did.

The necessity of being certain that a filling fills the cavity from edge to bottom is the chief thing inlay work has taught us. To obtain a filling as near the ideal as has yet been reached, put gold in on soft zinc oxyphosphate, and let the latter set; condense the gold, clean the edges of the cavity, and build the gold up to the edges, having all except the extreme edge filled and protected by zinc oxyphosphate.

Concerning that old story of the Jenkins body and the high-fusing body, I have in the last six months been making some tests concerning the relative strengths of porcelain. My basis was bars of porcelain, ground accurately to 1/1000 of an inch, 3/40 by 5/40 of an inch, cemented into blocks of ivory. The first question was how much of the strain of a ivory knife-edge, held perpendicularly to the porcelain, that porcelain would bear.

I found that the old Jenkins body—four years old—was able to stand twenty-six pounds; the new body could stand sixteen; the S. S. White body could stand twenty-six or twenty-seven; the Whiteley about twenty-three pounds. That was all very interesting, but when we tried the percussive blows, I found that eight ounces delivered through a distance of one-quarter of an inch would break any of them. When I embedded the porcelain bars in rubber dam, to represent the peridental membrane, they would stand perhaps sixteen ounces of percussive force. In discussing a filling in the mouth that may get a blow of from forty to one hundred pounds, it does not make much difference whether it will stand eight or ten ounces. If it gets the blow it will break; and if it does not get the blow, it will not break.

It is the problem that confronted the knights of old. They used armor as a protection until shot was discovered that penetrated the armor; then they threw the armor aside.

We must so construct the filling that it is not likely to get a blow on the weak part—the edge—and fortunately we can ordinarily do so. The shortest time in which a porcelain filling can be made by Dr. Dills' method is four hours. If a patient wants a filling put in a labial cavity up under the gum, I can insert it in half an hour.

There is only one insoluble cement that we have yet found, and that is amalgam. We can thank fortune for that, for in many cases inlays chip where they do not show, and when such places are filled with amalgam or gold, we have something that will be able to stand twenty-five or thirty pounds and not chip. The metal will yield slightly, while porcelain, the moment it gets beyond its regular resistance, will crush.

Let me explain what I have explained before. When we have a cavity that goes up under the margin of the gum, and use gold as a matrix, we must either, as Dr. Dills has very well pointed out, take an impression or push the gum back by means of gutta-percha. In the case of a platinum matrix, where the gum comes down to the cervical margin of the cavity, it is much less difficult to form a good mold. Take a piece of platinum foil 0.001 of an inch in thickness, put it so it rests one-quarter of an inch up over the gum, and conform it to the two adjacent teeth on either side of the tooth with the cavity. If preferable, the cavity can first be oiled. Take a piece of bibulous paper in a pair of blunt-nosed pliers, press the foil down into the cavity; when the foil approaches the bottom take out the bibulous paper, holding the platinum foil firmly, and the upper outline of the cavity will be clearly defined. The soft platinum becomes rigid under pressure, and it will push that gum right back, and keep it back.

Having carefully proceeded so far, outline the margins with a fine burnisher, and work the platinum foil down against the edges of the cavity; push the rest of the metal firmly to the bottom, and if the foil tears it is of small importance, since it cannot involve the margins of the mold. The matrix can then be filled in the ordinary way.

The point made, that by means of this impression and the mold we can make a number of fillings, so as to see which is the best, would seem at first an excellent suggestion, and it is perhaps worth while; but I think those who have had experience with cervical margin cavities, especially those slightly under the gum, will find that it is the original judgment, and not the number of fillings that will count. Such a filling changes color when cemented into place. It is like painting with water colors. We must hit it right the first time, or we do not get it at all. That is the secret with porcelain. Every time you get any gum over the filling, the shadow is thrown on to it, and the porcelain darkens. If you do not succeed at first, you are not likely to do so the second time. You can take the filling out, and re-clean the cavity, but this is not a pretty performance. Glycerin and cement powder have been tried as a test of color under the porcelain, but this test is only a partial help.

I do not wish to be understood as condemning the method. For Dr. Taggart and the others I have great regard and profound affection. But I think if Dr. Taggart would exercise one-tenth of his ingenuity in using the method I describe, he would never again resort to this impression process.

Dr. W. D. TRACY. I have also been greatly interested in Dr. Dills' paper. I was first interested in the analysis he gave, showing how closely the porcelain inlay set with cement approximates the ideal filling, as outlined by Dr. Miller. Dr. Head criticizes Dr. Miller's statement of requirements for an ideal filling; but I should always be glad to be a student under Dr. Miller, and think Dr. Dills was right in comparing the qualities and virtues of porcelain to the attributes necessary as suggested by Dr. Miller. The most interesting part of the essay to me is where Dr. Dills points out a way to do inlay work without keeping the patient in the office while the work is being done. It is easier to take an impression and turn it over to the laboratory assistant than to prepare the cavity and burnish in the matrix. My present method of constructing inlays is by burnishing the matrix in the cavity, because I have felt after trying various methods of taking impressions and making casts, that my best results were always gained by burnishing the matrix directly into the cavity. Even then I give the matrix, with the color, to my laboratory assistant, and if necessary watch the progress of the work at different stages of the baking; and if it is a large inlay we arrive at the color in that way. If the impression system will give as good results in the hands of others as it has in the hands of Dr. Dills, I am sure it is worth looking into very seriously.

As to the ideal filling, I agree with Dr. Head that we will never gain it in this world, nor are we likely to gain any other ideal; but we can work toward it. It matters not whether we reach it now, or not; we have these splendid porcelain fillings at our disposal, and we should make the best use of them, that our patients may reap the benefit. I shall take pleasure in trying this system as described by Dr. Dills. I have read of it, and know Dr. Taggart and others have advocated it; but I have never come so closely in touch with it as through the essay of this evening, and it has interested me to a point that will lead me to try it.

Dr. A. R. STARR. I have had very little experience with the method advocated by Dr. Dills of making the matrices from impressions. I have always felt that it is a simpler matter to take the impression from the cavity by burnishing the matrix into it. My chief difficulty with porcelain fillings has been the color problem. I can always manage to match the color of the tooth pretty closely, prior to the introduction of the inlay into the cavity with the cement; but to obtain a satisfactory combination of both requires a great deal of judgment, and not a little guessing.

Dr. R. M. SANGER, Orange, N. J.

I was very much interested in Dr. Dills' paper. He speaks of it as his maiden effort. I am sure we will all be grateful listeners to any of his future efforts.

I am impressed with one fact in regard to inlays, which seems to be that the real filling is the zinc oxyphosphate. The question is, how good a protection we can get for an oxyphosphate filling. That seems to sum up the whole matter. We are now in the era of both porcelain and gold for inlays, but without the oxyphosphate we are lost.

The little swaging device I saw for the first time today, and was much impressed by it. It seems to me a means of doing many fillings readily and expeditiously that we could not do without it, and I am very much obliged to Dr. Dills for his presentation of it to us.

Dr. **John I. Hart.** I do not think at this day much time need be spent on the use of porcelain in its proper place. In many of the cavities for which we desire to prepare inlays in the anterior teeth, time would be lost in taking impressions and working from them. There is the distinct disadvantage in working from the impression that in each stage that we work away from the cavity we are apt to lose definition; but in working on an approximal surface—take the mesial surface of a first bicuspid—it requires so much wedging to get a satisfactory matrix that I can well see the advantage of proceeding as Dr. Dills has described.

I doubt if a porcelain inlay back of the first bicuspid possesses sufficient strength to restore the lost tissue permanently.

Dr. Head spoke about so adapting porcelain that it would not have to withstand the stress of mastication. If we treat many mesio-distal approximal surfaces in that way, we reduce the amount of masticating surface for our patients, so that I can see the advantage in some situations of the gold inlay which Dr. Dills has described, and I am infinitely obliged to him for bringing to our notice a method of which we have heard so much, but which we have not had described so specifically until tonight.

Dr. **C. A. Meeker**, Newark, N. J. The discussion so far has brought to my mind the experiences I have undergone during the period since porcelain inlays first came into use. Like a good many others, I was very enthusiastic, and did everything in porcelain. Since that time, I have been taking out and replacing much that I have done. I hope I have attained more wisdom and judgment in putting in porcelain fillings in the last three years than I had previously. Now I am very careful when a person comes to me and asks for a porcelain filling, to judge what the stress would be on that particular filling. If I think it would only last a short time, I go back to the good old standard of gold.

In making matrices I use the same old method I was taught originally, of burnishing the platinum in the cavity. I suppose I have the same trouble as others with the color. From the West we always hear of new things, and now, I believe, the gold inlay is the proper thing; but I have not reached that stage yet. Sometimes gold fillings have come out, and I have reinserted them with oxyphosphate. I do not know what dentistry would do without oxyphosphate and amalgam.

Dr. **R. Ottolengui.** There are one or two details in this work that have been omitted, and you will meet the necessity for these details as soon as you start. After taking the impression, the essayist says he fills it with amalgam. If it be a patient from whom you are particularly anxious not to require too many visits, my advice is to take four or five impressions. In fact, I do not think I have ever yet made a good model with amalgam. That is so true that in all cases I have lately had, I have taken two impressions, filling one with oxyphosphate and one with amalgam, because it seemed a little easier to fill it accurately with oxyphosphate. Some of the men in Chicago claim that the oxyphosphate is so much better than the amalgam that they do not use the amalgam. Dr. Nyman says it is a question of the amalgam, and that you must use Sterion white alloy.

There is one thing about this method: do not think that it is going to be a cure-all. I do not think it is universally the best, nor that we will give up entirely impressions direct from the cavity. Just in proportion as the cavity will be difficult to work by hand, so will you be benefited by the impression method. The essayist speaks of labial cavities, with the margin under the gum. Not only in such cavities, but in all cavities near the gum, and approximal cavities in bicuspids and molars, beautiful impressions of cervical margins may be obtained, because the material is just hard enough to press the gum out of the way. I use cold water to chill it quickly.

Another thing I want to say, and I am sorry Dr. Head has gone. I think Dr. Head has the idea that Dr. Taggart treats all cavities after this method. He does not. Dr. Taggart is an exceedingly skilful and broad man, and I do not think there is anything that you or I know that he does not know, and can do skilfully. He employs all methods using the best for the case at hand.

Dr. Tracy. I think what Dr. Ottolengui said is true. There are many splendid things being done in Chicago that we do not do, and things happening there in dentistry about which we do not know. We cannot all be in the front, and at the head of the procession. Some have to lead, and some to follow. Of course we do not always want to be the followers, but at times we may have to follow as in times past they have followed us. I do not want it to go on record, however, that we had to learn from Chicago about the Detroit compound for taking impressions. When that material first came out, at least five years ago, some samples were left at our office, and at that time Dr. Perry—with whom I was then associated—was making some extensive experiments with impressions for the sake of saving time.

Dr. Perry took the impression of the cavity in the Detroit compound—in this impression a cast was made, using the English plaster of Paris. This cast was dried, treated with stearin, and used as a model into which the matrix was burnished. But in that method you have many manipulative changes, and I believe the farther you get away from the cavity, the more apt you are to have some discrepancy in the manipulation, and in the final result of your work. If the method in question is going to give us the finished work as nicely as we want it, it will be a good way for those who have a trustworthy assistant in the laboratory, as Dr. Dills has. We can take two or three impressions, and let the patient go; when he returns we can devote our time to inserting the finished inlay. That is the part of the system that appeals most to me, and I trust I may meet with some success in its use.

Dr. W. B. Dunning. I would like to emphasize the point already made that this method is especially suitable to difficult cavities. I agree with Dr. Head that in many cases, especially small labial cavities, the ordinary means of taking the direct impression is quicker and simpler, and frequently more accurate; but I think in the making of large and elaborate matrices, where there is danger of warpage, this is a very good idea.

Dr. Louis C. LeRoy. I would like to call attention to one system that seems to have been overlooked. That also comes from Chicago. It was described at a clinic given at an odontographic meeting by a man whose name I have forgotten. His system comprises the taking of an impression of the cavity with cement. The whole procedure is a departure from the method described by Dr. Dills. It consists of taking an impression in oxyphosphate, or Archite cement. I think the latter the better material, although we have practically discarded it. It is admirably adapted for this work, particularly for sub-gingival and inaccessible cavities. The impression is taken in the usual way by using something to hold it to the cavity. A better impression is obtained because in the removal of it there is no danger of changing shape as with the compounds. Archite hardens very quickly. Support the impression in more archite, so as to sustain the edges, if they happen to be frail, and when the impact of swaging takes place, you have something to back it up.

Then the ordinary swaging apparatus is brought into requisition. Crystal gold

—a mass of it, sufficient to cover the edges of the cavity—is forced into the impression with the fingers; an ordinary soft vulcanite rubber is placed over that, the plunger placed over the latter, and the mat gold forced into the impression. That gives as perfect a matrix of the cavity as does any method I know of, by swaging.

After the parts have been separated and the matrix removed, the porcelain is baked in the usual way. I have had excellent results from that form of manipulation.

Dr. Martin C. Tracy. I would like to ask Dr. Dills if we might not use a matrix sufficiently heavy to form a gold inlay with that swager.

I would like to recommend a perfectly white cement. I know of one—the Stanley—which may be bought of The S. S. White Dental Mfg. Co.

Dr. Ottolengui. This machine was really made for swaging caps for gold crowns, and it is used more for gold inlay work than for porcelain. I have permission from the essayist to answer this, because I want to show you a little trick. It does not matter so much with this thin foil, but the heavy foil used in gold inlay work will be knocked out of position. If the finger is held below the hole at the end, the air is kept in, and there is no concussion to displace the gold from the model as it drops to the bottom of the swager.

Dr. Dills. I want first to express my appreciation of the very kind attention and liberal discussion which has been accorded my first attempt as an essayist. While I must differ with some of those who have taken part, I feel that I have been more than repaid, and certainly very greatly benefited.

Dr. Head has misinterpreted a part of my paper, at least. I do not claim that we have at hand the ideal filling, but that in a combination of zinc oxyphosphate cement and porcelain, we have come nearer the goal than with any other available material.

Further, he speaks of the method of burnishing matrices being much quicker, and in this I cannot agree with him. The time from the beginning of an operation to insertion of the inlay, in the actual time consumed, is very much less by the impression method than is possible in the former.

Dr. Hart claims that in compounding the operation there is less chance of a perfect operation in the end, which is true theoretically; but I am convinced that when a material like gold or platinum has to be burnished so much that it becomes almost unmanageable, to say nothing of the difficulty of its removal when the matrix is formed in the tooth, the final results are less likely to be perfect than when the difficulties are finally overcome in the impression method.

Dr. Ottolengui has probably hit the keynote, that this is a matter largely of individuality; what is easy for one operator under certain conditions is very difficult, if not impossible, to another under like circumstances. And if this be so, it is one of the strongest arguments in favor of the adoption of the impression method, in part at least.

The question of making dies from the impression with amalgam is a very simple one. The amalgam is mixed as for an ordinary filling, and burnished to place carefully, as in a cavity of a tooth, of course understanding that the impression is invested in plaster, to form a small abutment for the proper maintenance of the amalgam until it sets.

On motion a very hearty vote of thanks was given to Dr. Dills for presenting his interesting paper, and also to Dr. Head for coming from Philadelphia to discuss the paper.

Adjourned.

B. C. Nash, *Secretary.*

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

(Continued from page 342.)

Second Day—Morning Session.

The meeting was called to order at 10 o'clock Friday morning by Dr. Bowles, president of the District of Columbia Society.

The first order of business was the reading of a paper by Dr. R. L. Simpson, Richmond, Va., entitled "A New Anterior Bridge Abutment: a Chalk-Talk," as follows:

A New (?) Anterior Bridge Abutment.

Crown and bridge workers are eagerly looking for a satisfactory anterior bridge abutment to be used on sound or practically sound teeth.

Those in general use are far from satisfactory. The most used is the open-face crown—of all crowns the most abominable. Its use means mutilation of the shape of the tooth in view. If not unsightly, it is too weak. It results in ultimate loss of the tooth by caries, because strain breaks the cement attachment, and this once broken, saliva and microbes enter, soon followed by decay.

The all-gold shell is without doubt the strongest and most durable, but is contraindicated on the anterior teeth because of its unsightliness.

Alexander's hood abutment is the most ingenious substitute for the above crowns so far advocated, in that there is no show of gold, and also because it obviates the necessity of mutilating the natural crown. Its most serious disadvantages are painful preparation of the tooth; the heavy grinding required endangering the life of the pulp; difficulty of construction, so much so that most operators do not attempt it; insecurity, because the strain is on its weakest part (ends of staple), and when the cement attachment is once broken, it is no better than an open-face crown.

Extremely conscientious operators are inclined to use some form of the Richmond crown, banded and unbanded. But we are surely not following the best procedure when we cut off the crown of a sound tooth. The patient's sentiment about its possession, in most cases, is a demand that it be saved. It is also difficult to match the shade, shape, and former position with porcelain facings, and here lies its greatest drawback; generally speaking, any plan that increases the number of facings increases the likelihood of future trouble.

In view of these facts, those who do the greatest amount of esthetic bridge work will concede that present methods are only make-shifts and compromises, inviting disaster, failure, and discouragement. While at a literary university we were taught that when failure seemed imminent the thing to do was to go back to first principles, and start over.

That is what we must do in this case. I shall not attempt to give credit for inspirations, for I frankly confess I have robbed both Peter and Paul to perfect the abutment now presented to you.

We know that the farther into the ground a fence-post is placed, the more secure it is. So also the deeper into the root we put the pin, the more secure becomes the attachment, and the whole root bears the shock of any strain.

The method which I advocate is as follows: Insert a pin into the root-canal, burnish a gold plate over the sides and back of the prepared tooth, unite the pin and the plate, and reinforce the gold plate with solder.

The exact technique is as follows: Drill with a No. 1 bur a pit into the distal part of canine until the dentin is reached. With Myer's or other high-pressure syringe, inject into the tooth a cocain solution, and through the opening thus made expose and remove the pulp. Sterilize the canal thoroughly, and seal the apex with a small cone of gutta-percha. Trim the palatal part of the canine so that the plate will not interfere with the bite. The approximal sides are ground so as to include the points of contact, keeping in mind the removal of the abutment. (See Fig. 1.) With Peeso's smallest reamer, enlarge the canal as deeply as practicable—certainly as deeply into the root proper as the crown of the tooth is long. This depth prevents the strain directed against the tooth from breaking off the crown at the gum line, as the length of the pin makes the root bear the strain equally with the crown. The canal is enlarged more readily by inclining the base of the reamer towards the incisal edge. Taper a No. 15 iridio-platinum wire, and see that it penetrates deeply into the root-canal. Place on the tooth a piece of No. 34-gage, 24-k. gold plate, into which a hole has been punched with a plate punch a little closer to one side than the other; push the pin through the hole in the gold into the canal as deeply as it will penetrate; remove pin and plate together, and unite them with a small particle of 22-k. solder. Replace pin and plate on the tooth and burnish the gold thoroughly to place, cutting off as much plate as overhangs that part of the tooth which is not to be covered by the plate.

FIG. 1.

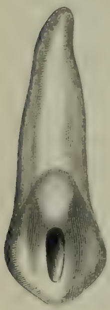


FIG. 2.

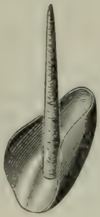


FIG. 3.

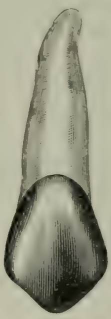


FIG. 4.

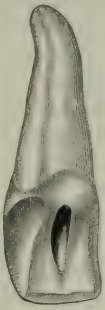


FIG. 5.

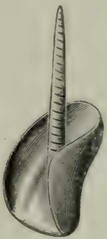


FIG. 6.

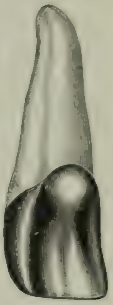


FIG. 7.

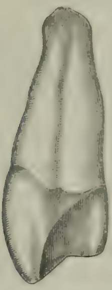


FIG. 8.

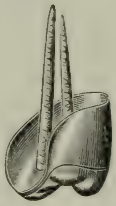
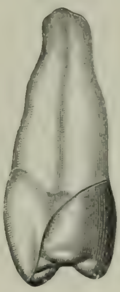


FIG. 9.



After trimming it to the proper size and having it burnished thoroughly, cover the inside with alcohol and whiting to prevent the solder from flowing in that direction. Without investing, flow 22-k. solder all over the back of the plate, so that it will just clear the bite or until it be thoroughly stiffened. Some grinding of the reinforced part is at times necessary to clear the bite. In reinforcing, it is best to use as large pieces of solder as possible, being careful to avoid overhanging edges, as this overhang is liable to cause the solder to run inside and ruin the fit. Replace the piece on tooth to verify the adaptation, and if perfect it will mean an abutment that will please the most exacting. (Figs. 2 and 3.)

The dentist should blush with shame who cannot now remove pulps without discoloration or abscesses.

Advantages: No pain of preparation; no esthetic mutilation; no selection or cracking of facings; no display of gold at all; simple, easily made, and strongest; most permanent, because it is most secure, and prevents the ingress of saliva, bacteria, etc.; most secure, because the strain is borne by a pin firmly embedded in the root-canal. The edges bear no strain, as the tooth must move with the pin, and consequently the cement attachment remains unbroken.

This method is applicable to the ten anterior teeth. If a corner be broken off the incisors (Fig. 4), it is a simple matter to burnish the gold plate over the prepared edge, and build out the contour with solder, using gold or iridio-platinum wire as a core on which to flow the solder, just as Mellersh cores are used in porcelain inlay work. (See Figs. 5 and 6.)

For bicuspids the procedure is a little different. Before the grinding surface is mutilated, an exact duplicate of the cusp should be swaged, as in making a shell crown. The pulp is removed, and the approximal sides and the grinding surfaces are ground to allow for a good thickness of gold. (Fig. 7.) Burnish 24-k. plate No. 34 gage over the prepared tooth before attaching the pin or pins. It is sometimes necessary to overlap the gold at the palatal part, in order to render the burnishing easier. When well adapted and after the pins are attached, they are placed on the tooth, and the cusp, previously swaged, is trimmed and adjusted to the cap and held in position wth sticky-wax. (Fig. 8.) Any fault in the articulation is corrected while the piece is in the mouth.

The parts are removed together, the waxing completed, and the whole invested in sump or any similar investing material; the wax is then boiled out, and 20-k. solder flowed in. Even in bicuspids with large crowns and small necks this attachment will go to place accurately. (See Fig. 9.)

By covering the approximal surfaces future decay is prevented, as well as a lateral splitting of the root. It also offers a firmer attachment for the dummies. In some cases it is not necessary to cover the approximal surfaces, but it is strongly urged that the cutting edge of the prepared tooth be protected with gold, but not so thickened as to expose it to view. The pin must be long, of ample size, and of iridio-platinum, as any other metal will not be sufficiently stiff after soldering.

This system is not foisted upon an unsuspecting and eager profession, but is the result of careful observation, which leads to the belief that this is the most universal and best anterior abutment at the command of the profession.

Discussion.

Dr. C. J. GRIEVES, Baltimore. I think we are all to be congratulated on having heard Dr. Simpson's rather complete *résumé* of the rudiments and fundamentals of crown and bridge abutments, for while radical at times, in the main he is safe and sound in his criticism. I know something of this device, and in the form applied by Dr. Simpson it is, in my opinion, new. The combination of root-canal post and palatal plate on the anterior teeth was well known prior to its illustration in the "American System of Dentistry," but the post and the plate as he applies it is a very different thing, being really a cast gold filling anchored by a post, quite like the work of Dr. Alexander. It is all a question of detail, especially where minute detail makes a world of difference. I believe this to be a conservative bridge attachment, provided it be built as he says of fine inlay gold carefully burnished to the prepared palatal surfaces and reinforced with solder, leaving fine gold edges free approximately and incisally, to be burnished in while the cement is setting. All of my failures have been right at this point. In finishing the work it was next to impossible not to destroy these edges and the joints after the piece was set; and the cement being eventually washed out, recurrent decay soon followed, as often witnessed in the case of porcelain inlays. Dr. Simpson some years ago published in the DENTAL COSMOS a paper relative to the irritation occurring about bands cervically, particularly bicuspids, and the remedy which he suggested consisted in using extreme care in the adaptation and restoration of the cervical contour. I am not a little surprised to hear him now assail the band crown, especially when one considers that he has done so much to insure its success by advocating the replacement of the enamel removed in the gingival space with polished metal to full contour. I want to know why he has abandoned this method and the cervical banded crown generally in practice. I would like him to clear this up in closing the discussion. If after having carefully pushed back the gingiva, a fine gold band—finished in full contour to restore the enamel removed at the neck of the tooth—is stretched over the root, and if every step in the construction of a Richmond crown be as carefully performed, could we have anything better to serve the purpose of bridge abutment anteriorly?

Dr. F. L. FOSSUME, New York, N. Y. I have listened with a great deal of pleasure to Dr. Simpson's paper; as a fact, I have practiced this very method he describes for several years. I will show in my clinic this afternoon a case of bridge work where the canines and first bicuspids on each side were loose, due to the stress of occlusion and to pyorrhea. In restoring teeth of this character without exposing any gold to view, my method is to devitalize the teeth and sink strong posts into the canals. In cases of pyorrhea, I believe the extirpation of the pulp itself is a help in fastening the teeth and strengthening them, and when fastened together with posts and backings on the palatal surface, it will be found that even the loosest teeth become firm within a few years, providing the teeth are kept clean, the gums stimulated, and general prophylactic treatment adhered to.

Dr. H. E. KELSEY, Baltimore. I have witnessed Dr. Simpson's clinics for three or four years. The first time he was showing a crown with a band, practically the Richmond method, finished so as to restore the contour of the enamel which had been removed in preparing the root. The next time he was using only a half-band, and this time he has discarded the band altogether. I presume there is some reason for this evolution in his method, and I would be very glad to hear what this reason for so doing is. I think the profession is largely discarding bands and depending more upon heavy posts, and I think very justly so. I am myself following this practice almost entirely. Dr. Simpson's method of using the post and cap, as Dr. Grieves says, has some features of novelty, and I deem it the only rational method of attachment for such cases. I think the point of Dr. Alexander's crown not being strong enough was not stated in the proper way. His reasons why this crown is not so successful may be true, but Dr. Alexander adopts this crown for live teeth and not for devitalized ones. I presume that in the case of devitalized teeth, Dr. Alexander would adopt Dr. Simpson's method. Where a patient will not consent to having a tooth devitalized, some other method must be used, and for such cases I think there is nothing quite equal to the Alexander method.

Dr. B. HOLLY SMITH, Baltimore. I want to thank Dr. Simpson for the very forceful manner in which he has presented the subject. Certainly it seems to me that, as Dr. Kelsey has said, our departure from the practice of banding the roots of teeth is a very safe and desirable one, and any attachment which will enable us to more easily and readily abandon the practice which disturbs the gingival structures and thus causes pathological conditions to develop, is a desirable one.

One statement the essayist made, however, opens up a large question—that is, our ethical obligations to our patients. I don't think I should feel satisfied to place myself in Dr. Simpson's care if he does exactly what he says, remove pulps of teeth without any regard to his patient's opinion, and without any regard to his desire as to the removal of the dental pulp, but proceeds to inject cocain and remove the pulp. I think if he does that, he violates a very sacred relation which should be established and should exist between the operator and the patient. As in surgery, I think a man's family, at least, should be notified if he is to be mutilated. It possibly may be a correct procedure; no doubt, with the graceful way in which he accomplishes these things, it may be in his hands safe and all right, but it is not good preaching. I would not care to tell a class of dental students to go ahead and remove the pulps of teeth without the patient's consent. I do not think it difficult to obtain the patient's consent to have these things done when that confidence which is so essential is established between patient and operator. Neither do I think it necessarily detracts from the value of the operation to have the patient's consent, and to have him know what one intends doing.

Dr. Grant Mitchell, Youngstown, Ohio. It very often happens after a man has told a clever story in a very clever manner, that someone in his audience will force a little laugh, then remark, "Yes, I heard that story, only I heard it this way"; then he drones over the whole tale again to supply some unimportant detail, the omission of which might, perhaps, have only strengthened the point. Were I to attempt to discuss this paper, I am afraid my remarks might partake somewhat of that order. The point of the paper is good and well brought out. The attachment, however, that Dr. Simpson dwells on is not new, and I think Dr. Libbey will bear me out in the statement that Dr. T. H. Whiteside demonstrated the same method before the Odontological Society in Pittsburg, at least fifteen years ago. I have seen several cases of his in the mouth which have done good service for years. The only difference is that Dr. Whiteside uses gutta-percha in mounting instead of cement. The cement will wash out, and the gutta-percha will not.

I wish to controvert the idea that the banded crown is obsolete. There are many cases requiring replacement where it is absolutely necessary to use banded crowns. One need not extend the band entirely around the root, as that is not always necessary. In a case such as is illustrated on the board, however, the band is unnecessary, and to that extent, perhaps, has become obsolete.

Dr. F. Groshans, Baltimore. I want to say that I believe in the banded crown, and I think the reason why many of us do not believe in it is because we have not made bands but have made hoops in consequence of having made the band V-shaped instead of U-shaped; and when such a band is slipped under the gum, it creates the pathological conditions to which Dr. Smith referred. I think if the medical profession has been able to trephine the upper plate of the cranium, and replace this with a silver plate so that the soft tissues will grow over it without creating any pathological condition, it is a reflection on the skill of the dental profession that we are not able to band a root without imposing upon the soft tissues around that root. I say I think it is a reflection on the dental profession to make this admission.

Where a band which does not fit is inserted over a root, one runs the chance of splitting that root, because the mechanical conditions will favor the occurrence of such an accident. I believe that the pressure of mastication is sixty pounds to the square inch, and when that amount of pressure is directed at the cutting angle of a crown, and with no band to hold the root, one is not giving the patient the best possible service.

I just want to say incidentally that the reason why many do not make Richmond crowns is because they do not know how. I am willing to be responsible for this accusation. Many do not know how, because it takes too much time and patience, but I want to say, and I do not consider myself a skilful operator, that I have been able to overcome that difficulty with time and patience, by using

Evans' root-trimmer. With this instrument one can trim a root very nicely and in a very short time. It is made in two sizes, with the point shaped like the end of a screw. When this rotates in the dental engine the blades run toward the operator, and it is surprising how readily and quickly one can trim the sides of a root at right angles with the axis of the tooth. My attention was first called to the use of it by Dr. Capon of Philadelphia.

Dr. R. L. SIMPSON, Richmond, Va. I thank you very much for your free discussion of the subject presented to you. It is necessary for the success of any method, and "In a multitude of counselors there is wisdom." Dr. Grieves has struck the keynote of this method when he says "minute detail makes a world of difference." This is not simply a pin in the root and a gold back on the tooth, but it is a cast filling constructed on lines of tooth-preservation, held in place by a stiff pin placed deeply in the root-canal. The tooth is trimmed to include the surfaces most prone to decay, and is reinforced with gold stiff enough to prevent the plate springing away from the tooth. If anyone thinks these abutments are flimsy affairs, he has failed entirely to grasp my meaning. The specimens shown may appear frail because they are single crowns, but when dummies are attached they are strong enough for any bridge purposes, being heavily reinforced with solder. If they are thin and weak, it is because they are not properly made. The edges must be burnished after cementing.

The question of removing pulps from sound teeth has never been a serious one to me. Fortunately the greater number of patients leave that matter to my judgment, and if I have explained it at all to them, it was simply a waste of time. I would of course explain to a total stranger. It is surprising that Dr. Smith should have encountered any difficulty. This statement is radical, but I am talking to experienced practitioners, not students. The seriousness of the operation is mentioned in deciding between plate or bridge work, but with the average patient the difference in price is a more serious thing than the removal of pulps; the removal of dollars from their pockets is more serious than the removal of pulps from their teeth.

The banded crown was abandoned because the band is not at all necessary. For years I worked to perfect the banded crown, and at St. Louis I advocated the "hat-brim" method for making anatomical bands, not hoops, as Dr. Groshans calls them. The hat-brim crown accomplishes all that I claim for it. If properly made these crowns will not irritate the tissues, but on the contrary the gum will grow over the band and conceal it. One hates to abandon his own child, and if my methods have attracted any attention, I owe it to this system as an introduction. It is a difficult undertaking to properly make a banded crown; it is time-consuming and painful. The average practitioner makes a rank failure of it. Its use at all is a question for discussion. Then why make it when there is something just as good, less painful, and much more quickly and easily made? An unbanded crown can be made in such a manner that the root cannot split any more readily than if it had been crowned with a banded one. Bridge troubles are not so much from split roots; but, as Kipling says, "that is another story."

At the outset of my talk I frankly stated that the inception of the method is not original with me, but that I had robbed Peter and Paul too. The subject as sent to the committee had a bracketed interrogation mark after the word "new," but the printer failed to so print it in the program. Why this method is not generally used is strange, as it ought not to be a new one, for it is the best universal abutment. I have given it to you as a complete system; if used as advocated, it will be to you "a thing of beauty and a joy forever." It is applicable as a restoration of a single tooth, or as a base for large porcelain inlays. In this or in any unbanded crown *the pin is the thing.*

(To be continued.)

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

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EDWARD C. KIRK, D.D.S., Sc.D.

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EDITORIAL DEPARTMENT.

CONCERNING HOBBIES.

THIS communication will deal with hobbies and defend the affirmative of the proposition that they are useful as well as entertaining. The doctrine of strenuousness, which has somewhat recently acquired large dimensions in the public eye, is, like most other good things, liable to do harm as a motive of action without a due regard to its correct and reasonable application to life-activities. To be strenuous simply for the sake of strenuousness is wasteful of energy, a dissipation of effort which subserves no useful purpose, and even the unremitting application of one's energies to a particular pursuit day in and day out may purchase a certain degree of success at a price far beyond the value of the ultimate reward.

The late distinguished author of "The Fool's Errand," Judge Albion W. Tourgée, once said in a public lecture that "The practice of economy as a means to an end is a laudable thing; but economy as a habit of action without such a motive is like working for the devil and boarding oneself." The mere habit of work for work's sake would seem to present certain analogies to this view of economy. The man who focuses his energies continuously upon the details of a specialty is the counterpart of the man who develops but one set of muscles; his mental development is as one-sided as is the physical development of the other. We would be able to view these cases of asymmetry, both mental and physical, with less concern if the effects of this kind of training were expended exclusively upon their possessors. But unfortunately the fact that the specialist is usually an expert within the limits of his specialty, and an authority as well, leads him to measure everything else by his own standards; his rôle as an authority on his own work tempts him frequently to overstep its bounds, and when he assumes the same rôle with regard to the other spheres of activity, it is just here that others are the sufferers.

Everyone recognizes the tendency of the continuous pursuit of a single idea to lead its captive into a mental rut, and what more obnoxious individual can be conceived of than the man with one idea who is continually harping upon his single mental possession because he has no other, and because, forsooth, he must harp on something. A corrective for this sort of thing is a necessity, for while the extreme case has been here used in illustration, the differences in lesser cases are but those of degree, and not of principle. The corrective is the possession of a hobby—an avocation as well as a vocation. The strenuous specialist will doubtless at once object that he has no time for hobbies, because all of the time not needed for his work must be given to rest and recreation for the sake of his health. The fault in this line of reasoning lies in the general misunderstanding of the meaning of recreation. We grant at once the validity of the claim for the need of periods of rest—total physiological rest; but recreation is to be found in a change of activities as well as in sleep or in that which is ordinarily classed under the term amusement. A change of activities at once gives rest to those bodily functions which have previously been employed, so that the man who has a hobby finds his recreation not in passive rest nor idle amusement, but in a change of work. But he finds more. He discovers, if his hobby be intelligently chosen, that he is constantly enlarging his range of activities, developing symmetry of mind or body and increasing not only his usefulness but his happiness. In this gain to himself he has made of himself a more acceptable citizen—a better social unit.

The calling of dentistry, with the constant study of its special details necessary to successful practice, tends too easily toward the development of the habit of living in a mental rut, and care is needed lest the dental idea grow to such proportions as to fill the whole horizon of thought. There are other things in the universe besides teeth, and yet the man who reads only dental literature, hears nothing of the world's business outside of dental meetings, and touches humanity only within the confines of the oral cavity, is likely to overlook some of the other important lines of human inquiry. He may be a finished expert within the walls of his office, but outside he is a grotesque monstrosity of one-sided over-development. He will find his intellectual emancipation, his social salvation, in hobbies—as many as he can afford to ride. To begin with, let them be well-bred—that is, selected with intelligent regard to their ability to carry him a good day's journey into new fields of thought where the experiences will be profitable with respect to their tendency to develop his latent powers and enlarge his wisdom. Let him learn from the exercising of his talents in hobby-riding how much may be accomplished by the careful utilization of even disconnected fragments of time. Let him learn the restfulness of a change of hobbies and the pleasure to be derived from the excursions which these changes give him into new avenues of activity, and he will discover a new meaning for strenuousness—he will re-define recreation, he will enlarge his capacity for pleasure, and if he is a dentist in a rut, will also learn for the first time, perhaps, that the pivotal point of the axis of the universe is not a "cuspid," or indeed any other member of the dental series.

A Correction.

In the article by Dr. Herbert L. Wheeler entitled "Is There an Ideal Occlusion?" published in the Dental Cosmos for January 1906, a typographical error which materially changes the sense of the paragraph appears. At page 25, in the second paragraph of the first column, the essayist is made to say, "—typical cases that we have so nicely cataloged and arbitrarily divided in two types," whereas the last words should read, "divided *into types.*"

The error arose from the fact that we received by mistake an uncorrected copy from the secretary of the First District Dental Society instead of the revised copy in which the author had corrected this error of transcription by the typewriter. We call attention to this matter here for the reason that the misprinting of the paragraph in question has given rise to some criticism which in the light of the explanation here made is not applicable to the thought which the essayist intended to express.—Ed. Cosmos.

BIBLIOGRAPHICAL.

THE WORLD'S ANATOMISTS. By G. W. H. KEMPER, M.D. With Eleven Illustrations, Nine of which are Portraits. Philadelphia: P. Blakiston's Son & Co., 1906. Price, paper, 50 cents.

This little book contains short biographical sketches of famous anatomists from a period beginning three hundred years B.C. to the present time, nearly twenty-two hundred years. The names of those who have made anatomical discoveries enter so largely into the accepted nomenclature of the subject that some idea of the personal history of the men who have thus enriched our knowledge is almost necessary to a clear understanding of the subject. Besides this important feature, an acquaintance with the personal biography of those who have been instrumental in creating anatomical knowledge serves to vitalize that subject and clothe it with additional interest and dignity. This brief *exposé* of the biographical side of the makers of the science of anatomy will therefore serve both a useful purpose and as a means of instructive entertainment to all who have an interest in the history of anatomy and its development as the foundation of the healing art.

ANATOMY, DESCRIPTIVE AND SURGICAL. By HENRY GRAY, F.R.S. Edited by T. PICKERING PICK, F.R.C.S., and ROBERT HOWDEN, M.A., M.B., C.M. New American Edition, Thoroughly Revised and Re-edited with Additions by JOHN CHALMERS DACOSTA, M.D., Professor of Principles of Surgery and Professor of Clinical Surgery in Jefferson Medical College, Philadelphia; Surgeon to the Philadelphia Hospital, etc. Philadelphia and New York: Lea Brothers & Co., 1905.

To the student of medicine or dentistry Gray's Anatomy needs no introduction. Almost from the time of matriculation to that of graduation this text-book is the close and inseparable companion of the student, to whom it renders services the magnitude of which is fully in harmony with the important place which anatomy of necessity occupies in the curriculum of medicine and the allied professions.

The present American edition has been thoroughly revised and re-edited by Dr. John Chalmers DaCosta, and his efforts in this connection are worthy of the highest praise. J. E.

MANUAL OF OPERATIVE SURGERY. By JOHN FAIRBAIRN BINNIE, A.M., C.M., (Aberdeen), Professor of Surgery, Kansas State University, Kansas City, Fellow of the American Surgical Association, etc. Second Edition, Revised and Enlarged. With 567 Illustrations, a number of which are printed in colors. Philadelphia: P. Blakiston's Son & Co., 1905.

The exhaustion of the first edition of this book within nine months after its appearance constitutes the most forceful argument that could be advanced regarding the adaptability of the work to the needs of the surgical practitioner and student. The subject of operative technique has been treated in all its aspects and in a style not only forceful and explicit but likewise comprehensive. His careful attention to the description of the minutest yet ever-important details of surgical procedure, without, however, encumbering the text with literary references often unnecessary and perplexing, constitutes a feature of the work the importance of which can hardly be overrated.

The book, while intended especially for the general surgical practitioner, contains nevertheless information well adapted to the needs of the oral and dental surgeon. We desire in this connection to particularly emphasize the chapters on the frontal sinus, tic douloureux, excision of the upper jaw, resection of the lower jaw, hare-lip, cleft palate, tongue, parotid gland, rhinoplasty, acute abscess, drainage, and ligatures and sutures.

The work because of its intrinsic valuable features deserves a leading place on the bookshelves of the general surgeon and as a reference work on those of the oral and dental surgeon. J. E.

THE DENTIST'S MAGAZINE. Vol. I, No. 1, for December 1905. Editors—Drs. W. T. JACKMAN, GEO. H. WILSON, W. G. EBERSOLE, and VARNEY E. BARNES. Cleveland, Ohio: The Cogswell Supply Co.

The periodical literature of dentistry has recently received an additional stimulus by the appearance of a new contemporary,—the *Dentist's Magazine,* issued by the Cogswell Dental Supply Co. under the combined editorial supervision of Drs. W. T. Jackman, Geo. H. Wilson, W. G. Ebersole, and Varney E. Barnes.

The new magazine possesses many commendable features, which will doubtless appeal to readers throughout the country. Its contributions have been judiciously selected, and many of them are by writers of international reputation. They are printed in a way intended to facilitate their perusal as much as possible, and to render their assimilation as little laborious as is compatible with the nature and scope of the contribution.

The attractiveness of the magazine, apart from the intrinsic value of the reading pages, is further enhanced by an artistic cover-page, the central feature of which is a half-tone reproduction of a symbolic statuette, "The Genius of Dentistry."

Published under such excellent auspices and under the able management of Mr. Albert M. Pearson, we augur for the *Dentist's Magazine* a long and useful career, and one from which dentistry will ultimately derive palpable advantages.

BOOKS AND PAMPHLETS RECEIVED.

L'Anesthesie Chirurgicale par la Stovaine. "Surgical Anesthesia with Stovain." By Dr. Léon Kendirdjy. Paris: Masson et Cie., 1906.

La Guérison de la Tuberculose Basée sur l'Étude des Cas de Guérison Spontanée: Traitement et Prophylaxie. "The Cure of Tuberculosis Based upon a Study of Spontaneous Recoveries: Treatment and Prophylaxis." By Dr. Paul Ferrier. Paris: Vigot Frères, 1906.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*L'Odontologie,* Paris, June 30, 1905.]

CYSTS OF THE MAXILLA OF DENTAL ORIGIN. BY DR. JULIEN TELLIER, LYONS, FRANCE.

The essayist descibes the case of a patient, aged thirty-five, suffering from a tumefaction of the right side of the face of two or three years' standing. It made its first appearance several months after the extraction of a number of diseased roots, which had previously given rise to a severe infectious pericementitis. Owing to the location of the swelling in the maxillary region, the corresponding side of the face was consequently very much disfigured. Upon examination it was found that the swelling protruded into the vestibuli oris, posteriorly to a remaining molar, in all probability the second, and that upon being compressed it gave rise to a characteristic parchment-like crepitus. The first molar, the two bicuspids, and the canine on the affected side were missing, they having been extracted at the time of the onset of the suppurative pericementitis. It was impossible to ascertain whether the third molar on the same side had been extracted together with the neighboring teeth, or whether it had never erupted.

The clinical history of this case may therefore be summarized as follows: First, caries giving rise to a suppurative periodontitis; treatment, cure, and several months afterward the appearance upon a neighboring area of a swelling which gradually though slowly increased considerably in volume.

After some hesitancy the patient consented to have an operation performed under the local influence of ethyl chlorid, being most emphatically opposed to the use of a general anesthetic. An incision five centimeters in length was made parallel to the free border of the arch. This gave vent to a yellowish-brown liquid containing particles of caseous matter. The cavity, which was three centimeters in width by one and a half centimeters in depth, was found to contain upon its floor the apices of the roots of the second molar, covered by a layer of osseous tissue, and in its deepest portion a body which later on proved to be the crown of a tooth. Upon its removal it was found that the cyst sac had been attached to the circumference at the neck of the crown. The cavity which extended to almost the orbital border was curetted thoroughly, treated post-operatively, and eventually began to fill up with osseous tissue. The encysted tooth, a multicuspid with a short curved root, resembled in form and general appearance an upper third molar. The fragment of the cyst sac removed with the tooth measured about eight centimeters in length by from two to three centimeters in width, and adhered firmly to the neck of the crown. The membrane was thick and resistant, the internal structure was perfectly smooth, and the external one while not exactly rough was made up apparently of fibrous tissue.

After describing histologically the structure of the sac, the author takes up the pathological phase of dentigerous cysts, embodying in this part of his paper information of a most instructive and valuable character. Cysts of the maxillæ may be divided into the following varieties:

(1) Dentigerous cysts, also designated as follicular cysts because they are characterized by the presence within the sac of a partially or completely developed tooth.

(2) Paradental cysts: (a) Unilocular, bearing no direct relation to the teeth. (b) Periosteal (radicular or appendicular), being in direct relation with one or more tooth-roots.

(3) Multilocular cysts (cystic multilocular epithelioma).

Two theories have thus far been advanced to explain the pathogenesis of dentigerous cysts.

The first is the so-called follicular theory as advanced by Forget, Guibout, Broca, and Magitot, and which in essence is as follows: The cysts originate and develop in the enamel organ, which occupies the space between the dental papilla and the wall of the follicular sac. Cysts of this variety may appear at the embryoplastic period, namely, at a time when neither the cells of the deepest layer of the enamel organ (future ameloblasts), nor the superficial cells of the dental papilla (future odontoblasts) are as yet differentiated, and consequently prior to the formation of either enamel or dentin. The dental papilla becomes atrophied by the external pressure of the cystic liquid, and while in some cases a portion of the papilla may be found within the sac, in others when the latter is opened no remains whatever of tooth-structure are to be found within. In this variety of cases the sac is composed internally of the cellular elements of the inner and outer layer of the enamel organ, and externally of a layer of connective tissue cells, which originates from the structural components of the follicular wall, and partly from the tissues of the dental papilla. If on the contrary the cyst should develop in the odontoplastic period, the sac will contain a rudimentary tooth containing both enamel and dentin. Otherwise the cyst sac will be composed of the same histological elements as those surrounding the cysts of the previous variety.

The second theory is to the effect that dentigerous cysts originate in the "paradental epithelial débris." It is a well-known fact today that upon the appearance of the enamel organ a number of epithelial prolongations develop from the gingival epithelium, the epithelial cord, or the enamel organ proper. In the fetus these epithelial elements are arranged in three groups, *i.e.* superficial, intermediary, and deep. In the adult these epithelial débris are found in the alveolo-dental membrane in the shape of a network which envelops the root, and in a fashion comparable to the arrangement of the net-work thrown around a balloon to support its basket.

According to the "epithelial débris" theory (Malassez) which has been investigated by Verneuil, Reclus, and Albarran, in the case under consideration the cystic formation occurred at a period when the crown had already attained almost complete development, the process of eruption having become arrested for reasons into which the author does not enter. As the result of the infectious pericementitis in the immediate neighborhood, a sufficient degree of irritation was produced to stimulate the growth and multiplication of the cells of the epithelial débris in the vicinity of the seat of the tooth. The cellular proliferation once begun, the reaction was accompanied by the secretion of a fluid (the cystic fluid), which the cells later on encysted. Gradually the cyst increased in volume, encountered the tooth, which perforated it, the cyst wall becoming firmly attached to the neck of the tooth. On the other hand, according to the follicular theory the cyst developed in the space between the crown of the tooth and the follicular sac. Through the irritation consequent upon the pericemental infection above described, the epithelial cells of the enamel organ secreted a fluid which gradually distended the follicular sac—the wall of the cyst according to this interpretation being constituted of the follicular sac itself. This assumption explains the strong attachment of the cyst sac to the neck of the tooth. In this connection it may be well to refer to the histological nature of the follicular sac, it being not as Magitot believed, an organ which originating at the base of the dental papilla in the form of two bands eventually encircles the dental papilla after sectioning the enamel cord, but, as M. Capdepont has recently described it, a differentiated form of connective tissue from the loosely arranged perifollicular connective tissue cells. As has been pointed out by Pierre Robin, the follicular sac persists until perforated by the tooth in the course of its eruption, and this, of course, constitutes an additional point in support of the follicular theory, particularly as affecting the case under consideration.

While it would not be reasonable to attribute the formation of all cysts to either one of the two theories exclusively, it may, however, be said in a general way that in both theories the ultimate origin is identical, *i.e.* from the epithelial cells of the paradental epithelial débris or from the enamel organ, the origin of both being of course from the same source, the invagination of the gingival mucous membrane.

Regarding the appendicular variety of cysts, the author says that the two theories which have been advanced to explain their formation, *i.e.* the periosteal theory of Magitot and the epithelial débris theory of Malassez, are tenable. In cases in which the inside of the cyst is lined with epithelial cells, the formation in all probability takes place in the way explained by Malassez, *i.e.* from the epithelial débris in the pericementum; while in those in which no epithelial cells line the sac internally, the formation takes place according to the way explained by Magitot, *i.e.* a bulging of the pericementum by inflammatory products. By appendicular cysts the author refers specifically to the abscesses which so frequently develop upon the apical end of a tooth-root.

[*Medical Times and Hospital Gazette*, London, November 25, 1905.]

BLUE-LIGHT ANALGESIA. BY HARVEY HILLIARD, ANESTHETIST TO THE ROYAL DENTAL HOSPITAL OF LONDON.

The author reports upon the use of blue light for the purpose of inducing insensibility, as originally recommended by Professor Rédard of Geneva. The author has tried the method upon himself and has noticed that this kind of light has a most distinctly calming influence, and that after some minutes' application upon the face sensibility to pain is lessened. For instance, in the experiments carried on by Mr. Hilliard the difference between light pressure made with the tip of the little finger and a needle could not be easily detected, and surgical needles could be pushed into the face, lips, gums, and arms, and blood drawn thereby without actual pain being felt unless a still deeper pressure was exerted. The analgesia seemed to be much more complete over the area of distribution of the cranial nerves than over the extremities.

These experiments were by no means exhaustive, but, however, warranted the application of the method to the extraction of teeth. In these cases the results have been variable, and an effort has been made by the author to discover to what cause the variability was due. In some a very satisfactory analgesia was produced, accompanied by a distinct tendency to somnolence with closed eyes and impaired consciousness after only two and a half minutes' application of the blue-light rays, while in others little or no effect was observed after a much longer period. In the best cases the analgesia was fleeting—that is to say, it lasted only long enough for three or four rapid extractions. The author is of the opinion that in the most suitable cases it would be possible to induce sleep and a very complete state of analgesia if the patient could be subjected to the rays for a sufficient time. It is likewise the author's opinion that the presence of a blue lamp suitably placed might give satisfactory results in the treatment of insomnia, and in one case in which he used it for the treatment of this disturbance the results were satisfactory.

With regard to the variability in the results, it is believed that excited, nervous, and fearful patients who do not obey instructions, who do not keep their eyes fixed upon the lamp but constantly blink and remain alert to everything in their surroundings, are hopeless subjects for the method. A large proportion of the author's failures were with patients of this class who had some knowledge or personal experience of what gas anesthesia is like, and who consequently could not make themselves believe that they could lose sensibility to pain without also losing consciousness. Others, again, apparently followed the directions and yet the results were unsatisfactory. This seemed possibly due to the very crude form of apparatus, in the use of which it was impossible to keep the light immovably fixed at an unvarying distance from the patient's eyes or at the correct focal angle. That is to say, at one moment the light might be properly projected into the eyes—and this is necessary to success—while at another moment it might not enter the eyes at all. Another disadvantage was that with the original apparatus very little ventilation is possible inside the thick veil it is necessary to use in order to exclude all white light, and consequently the patient has to re-breathe already vitiated air. The air also becomes greatly heated by the lamp, and is thus unpleasant for the patient and necessitates his blinking or closing the eyes to prevent the conjunctivæ from becoming too dry. The author has devised a new apparatus which consists of a sixteen-candle-power blue lamp with the filament placed at right angles to the stem of the lamp. The lamp is inclosed in a tin arrangement similar to a stereoscopic apparatus fitting over the patient's nose and around his orbits so that the mouth and nose are exposed and the patie t can breathe fresh air, all daylight being at the same time excluded.

In some instances two or three extractions were performed without much discomfort to the patient, but in others there was apparently no loss of sensation. The greatest difficulty the operator has in using this method is to know if and when analgesia is satisfactorily induced. The author's experience leads him to be now guided by the two following signs: Dilatation of the pupils, and closing of the lids. Dilatation of the pupils has been observed in most of the successful cases when the patient has kept the eyes open and steadily fixed upon the lamp during the application of the rays. The dilatation persisted for the first few moments of the operation in spite of the patient being exposed to the full daylight from a window opposite the chair. When the pupil again contracts the operation should be stopped. In some of the successful cases, however, the eyelids closed after a few minutes' application of the ray, and there is then no satisfactory means of ascertaining whether or not the patient is insensible to pain. The best results are obtained with patients of a calm temperament who are not highly nervous and fearful, and who are sufficiently intelligent to understand that analgesia can be induced without loss of consciousness.

In concluding the author summarizes the results of his investigations as follows: Analgesia may be produced by means of blue-light rays applied in a suitable manner, but the field of practical utility for this method is very limited. Owing to the length of time during which it is necessary to apply the rays, and owing to the brief duration of the analgesia so produced, the method is quite unsuitable in hospital practice, and better results can be obtained in a shorter time and with greater certainty by means of nitrous oxid. Blue-light rays may be usefully employed in cases in which a general anesthetic is contra-indicated. The author is unable to account for the results produced by the blue-light rays when applied in the manner above described; in this connection, however, he totally rejects the hypnotism theory. The good results obtained when the patient's head is enveloped in a blue veil with the blue lamp and reflector inside may in part be due to the narcotic effect of the vitiated air, which he is made to re-breathe for some minutes.

[*Stomatologist,* Philadelphia, January 1906.]

REPLANTATION OF TEETH. By Otto E. Inglis.

The operation of replantation consists in replacing in its own alveolus a tooth which has been accidentally knocked out by a blow or a fall, or during the extraction of an adjoining tooth, or one extracted by mistake, or a tooth which has been purposely extracted for the purpose of obtaining accurate access to some diseased portion of the root.

Regarding the technique of the operation, Dr. Inglis emphasizes the necessity of carrying out every step of the procedure under the strictest possible aseptic precautions. The tooth to be replanted should be immersed for a time in a ten per cent. formaldehyd solution, or a two per cent. solution of lysol. The latter solution, if warm, is likewise a useful one for the sterilization of the instruments used in the operation. The presence of the lysol upon the roots does not in any way prevent union, and assures asepsis after the replantation. The author describes in detail the manner of splinting and ligating a replanted tooth, and gives special directions in cases in which the tooth is replanted several days after luxation has taken place. An impression of the mouth should be taken, also the articulation; then an articulating model constructed. An artificial alveolus is then constructed in the plaster cast, and the tooth is placed in correct alignment and articulation. It is then secured in place with plaster about the neck, and an impression is taken with modeling composition; a plaster cast is obtained, and from this, in turn, a zinc die and a lead counter-die are prepared.

Upon the zinc die a plate is struck from 20-k. No. 30-gage gold, doubled or partly reinforced to cover the replanted tooth, and one on either side of it, almost entirely on the lingual side and partly on the labial. It is to be cemented to the teeth and allowed to remain for a period of six weeks. The treatment of the tooth to be replanted consists in cleaning, disinfecting, and filling the root-canal, and in placing the tooth in a lysol or formaldehyd solution. At the time of operation an implantation reamer is to be used to sweep out the granulations, and if wet with the lysol solution it introduces the antiseptic into the wound. The best method of checking excessive hemorrhage, after thorough irrigation of the prepared alveolus with an antiseptic solution, is to place the tooth in the alveolus and retain it with the finger. A little blood forms a clot about the root, which is advantageous as a scaffold for granulations if the mouth be kept sterile.

[*Dental Review*, Chicago, February 1906.]

PYORRHEA ALVEOLARIS. By Dr. T. A. Hardgrove.

After reviewing the etiology of pyorrhea alveolaris, the author describes his method of treatment, which consists in a thorough application to the pockets of warm lactic acid full strength, or trichloracetic acid five per cent. It is of course understood that this remedial application is not to be made until after the removal of all calcareous deposits from the surfaces of the affected tooth. In cases where the pus seems very persistent, it may be due to the presence of some necrosed tissue, and in order to provide a better drainage an opening should be made at the bottom of the pocket through the gum. In cases where the tooth fails to become consolidated the author recommends that the pulp be devitalized, and while he does not give any reason why this procedure should be followed, it may be stated in a general way that it is for the purpose of deviating toward the pericementum the blood supply—thus cut off from the pulp—in order to stimulate the nutritional functions of the pericemental membrane, and *ipso facto* its resistive power. The author also recommends that the gums be massaged, either with sulfur, as advised by Dr. Harlan, or with a combination of boric acid 2 oz., tannic acid 1 oz., glycerin 1 oz., and tincture of cantharides 20 grs.; the latter is preferable where there are many amalgam fillings, as the sulfur may discolor the amalgam. The tooth-brush may be kept sterile by a contrivance which the author suggests, and which is as simple as it is useful. A large sized test tube is constricted about an inch from the bottom, and in the lower chamber either a paraform tablet or a formalin solution is placed. After placing the brush in the tube, the latter is closed with a rubber stopper. The brush will be sterilized without injuring its structure.

[*Journal des Praticiens, Paris,* January 20, 1906.]

THOROUGH MASTICATION IN THE TREATMENT OF CHRONIC DISEASES.

By Drs. Monteuuis and Pascault.

Buccal digestion is the only phase of the general process of digestion which is, strictly speaking, a voluntary act. The buccal organs have a triple function; they triturate the food, regulate the temperature, and insalivate the bolus. Insalivation has to do with the digestion of starch and develops the sapidity of the food. To thorough mastication the authors attribute a very important hygienic and therapeutic rôle, and are of the opinion that all cases of dyspepsia and auto-intoxication could be markedly relieved by directing patients to masticate their food so thoroughly that eating would imply in that particular respect a series of exercises in mandibular gymnastics. The authors have found that it is possible to subsist comfortably on a smaller ration, if every particle of food be thoroughly masticated.

PERISCOPE.

To Bend a Wire.—Bend the wire around the pliers, instead of the usual method of trying to bend the wire with the pliers.—*Dentist's Magazine.*

To Sterilize Hypodermic Needles.—Immerse the needle in alcohol and pass it over an alcohol flame; the alcohol will burn out, causing the needle to become aseptic and dry. —*Dental Quarterly.*

To Color Plaster to Facilitate Separation.—Someone has suggested using a little bluing in the water for mixing the plaster for running the case, in order to facilitate the separation. This is an excellent idea, and should be used by all who have not tried it.—*Dental Hints.*

Rust Preventive.—Paraffin oil is the best preventive against rust. Dissolve one part of the oil in two hundred parts of benzine. Dry and warm the instruments and plunge into the solution, and work all points in the fluid in order to cause it to penetrate all crevices. Allow the benzine to evaporate in a dry room.—*Dental Digest.*

To Harden and Protect Plaster Casts.—Immerse the cast in a pot of boiling beeswax until thoroughly saturated. The wax penetrates throughout the plaster, making it hard and impervious to moisture.—*International Journal.*

[Paraffin may be advantageously substituted for beeswax in the process of hardening plaster casts—ED.]

Difference in the Shades of Under- and Over-fused Inlays.—The uniformity of color in porcelain is dependent upon the accuracy of the fusing. It is difficult to fuse porcelain at a definite degree of heat without some means of measuring the temperature. Many otherwise good inlays are spoiled in the furnace. Then, too, variations of the heat of the muffle will cause differences in the shade and strength of the porcelain. Under-fused porcelain is of a duller hue and is less translucent; while over-fused porcelain is lighter and has more of a glass-like appearance.—J. Q. BYRAM, *Dental Review.*

To Remove Inlay Matrix.—Use a medium-sized nerve broach sharpened out and prepared for the purpose; or a small explorer, coaxing it out very carefully so that the form will not be marred, or use a chip-blower to force air under the edges. A drop of water under the matrix will assist in freeing it.—W. J. UPJOHN, *Summary.*

How to Collect Spilled Mercury.—Mercury spilled on a table or floor is somewhat hard to collect unless special precautions are taken, owing to its tendency to divide into small globules which roll away at the slightest touch. If a wet ring be made round the spilled mercury, it will be found that the globules of mercury cannot readily cross this ring; the mercury can then be collected without difficulty in a small shovel made from a piece of thin card, or even in an ordinary envelope.—*Elliott's Quarterly.*

Treatment of Shallow Erosion Cavities.—In sensitive superficial cavities due to erosion or abrasion, warm solutions of trichloracetic acid in full strength applied two or three times, the cavity being dried between applications, will often enable one to penetrate to sound, non-sensitive dentin, after which the cavity may be prepared as desired. This procedure possesses real merit, and is beneficial in many cases. In all these cases, sharp burs are essential to secure the minimum of suffering to the patient.—GEORGE GOW, *Dominion Dental Journal.*

The Flat Cavity Seat.—In preparing any cavity for an inlay, the thing of most importance is the seating of the cavity, and this must be flat; the walls must be flat and as near at right angles to the seat as is possible for them to be made. Flat planes should be obtained, to assume the strain when stress is applied, and the margins should be square, never beveled as they are for gold fillings. Care should be taken that there are no undercuts to distort the matrix in its removal, and only in this latter respect does the preparation of a cavity for an inlay and one for a gold filling differ greatly; therefore any idea for retention you may have must be carried out with these facts in view.—CRAIG M. WORK, *Tri-State Dental Record.*

Cement Fillings.—A cement filling, zinc oxyphosphate, placed upon a surface treated with silver nitrate, will, for some reason, last a great deal longer and be a much better mass than the same mass not having the peculiar effect it receives from this film of silver albuminate. A great many no doubt have seen the effect of silver nitrate upon a surface which has been infected to a very slight depth. That in time will become a polished black surface, and further decay will never result. Now, if in deeper cavities we can make partial preparation and apply silver nitrate, and have it last longer than otherwise, it is worth knowing. This was brought to my notice by Dr. Eshelman of Tacoma, Wash., formerly of Chicago.—W. V-B. AMES, *Pennsylvania Dental Times.*

Sterilization of Instruments.—As to the sterilization of instruments, forceps, knives, clamps, etc., I use a sterilizer made of copper. It is practical and inexpensive. All instruments which have been used are taken to the laboratory. Those smeared with blood and pus are thoroughly scrubbed with a brush and soap, and are placed in the sterilizer which contains about a quart of water and a little sodium-carbonate, to prevent the instruments from rusting. They are then boiled for twenty minutes. This process insures perfect sterilization. Engine burs and broaches are cleaned with a rapidly revolving wire brush, and then placed in pure carbolic acid, to remain there until needed. They can then be washed in water and dried with a napkin.—E. M. KAPITAN, *Dental Review.*

Dentin Obtundents.—Carbolic acid, zinc chlorid, and trichloracetic acid in full strength solutions, are the agents which in my hands have proved themselves good friends in dealing with a large proportion of the cases of hypersensitive dentin not amenable to topical treatment. The selected agent is applied on a pledget of cotton to the desiccated and protected cavity, and being covered over with a thick layer of unvulcanized rubber, pressure is applied by means of a flat-ended instrument for a minute or two, when an area of insensitive dentin will ordinarily be found to have been secured. If much depth of excavation is needed a second application will be required. A saturated solution of cocain hydrochlorid may be used in exactly the same way; but the former agents have, I think, the advantage, inasmuch as the diminished sensitivity is permanent, while the cocain anesthesia is of course only temporary.—WM. SIMMS, *Dental Record.*

To Control Saliva.—An annoying operation to successfully perform is filling a lower third molar that cannot, for half a minute at a time, be kept free from saliva. Such a case presented in a young lady, of highly nervous temperament, whose flow of saliva was excessive. Placing of the dam was impracticable, and napkins placed in the mouth would almost immediately become saturated. This annoyance was overcome through the action of atropin sulfate, a dose of which (1/120 grain) I had her take three-quarters of an hour before her next appointment. At that time I found the mouth very dry, though not uncomfortably so for the patient. This salt of atropin has a much better effect on the secretion than the ordinary alkaloid. Its manifestations last from four to five hours.—H. OTIS LOGUE, *Stomatologist.*

Significance of Term "Methodical."—When we use the term methodical, or hear it used, we are apt to associate with it the habit of working in a rut. But it seems to me this is not the proper idea. I think when we use the word "method," we ought to understand that we mean to do things according to a system, not necessarily the operation that is being performed, but more particularly in regard to the materials and the instruments that we use and things of that character; systematically placing them away, systematically keeping them in order, and assorting them; taking care of our accounts and things of that sort. It seeems to me that we are apt to get a rather wrong idea as to the meaning of the word methodical. It by no means implies running along in the same old rut.—DR. MARTIN, *Tri-State Dental Record.*

Mounting of Porcelain Bridges.—The mounting of porcelain bridges should always be made with gutta-percha in preference to cement because of three very important features. First, when so mounted they may be removed at any time without difficulty or injury; second, the impact from the stress of mastication is relieved by the cushion-like effect imparted by the presence of this material; and third, it is almost impossible to use cement when a saddle is employed without forcing the surplus underneath it, and when this crystallizes irritation is the invariable result. It may also be further stated that ordinary base-plate gutta-percha, while somewhat more difficult to manipulate, seems to possess greater integrity, and to thus insure a greater degree of permanence than the various so-called gutta-percha cements.—HART J. GOSLEE, *Dental Review.*

Solders Glass.—Mr. Charles Margot finds that an alloy composed of 95 parts of tin and 5 of zinc melts at 200°, and becomes firmly adherent to glass, and, moreover, is unalterable and possesses a beautiful metallic luster; and, further, that an alloy composed of 90 parts of tin and 10 of aluminum melts at 390°, becomes strongly soldered to glass, and is possessed of a very stable brilliancy. With these alloys it is possible to solder glass as easily as it is to solder two pieces of metal. It is possible to operate in two different manners. The two pieces of glass to be soldered can either be heated in a furnace and their surface rubbed with a rod of the solder, when the alloy as it flows can be evenly distributed with a tampon of paper or a strip of aluminum, or an ordinary soldering iron can be used for melting the solder. In either case, it only remains to unite the two pieces of glass, press them strongly against each other, and allow them to cool slowly.—*Stomatologist.*

Neuralgia and Neuritis.—The literal meaning of neuralgia is "nerve pain," and strictly speaking the term is a name for a symptom, rather than for a disease. Yet custom has sanctioned its use in the latter sense, and the convenience of the term is its justification. There is, however, much looseness in its application, some authors distinguishing so-called "idiopathic" or essential neuralgia from "symptomatic" or secondary neuralgia. The meaning of these terms is obvious; essential neuralgia is the sort which is often transient or paroxysmal, often migratory, and apparently not due to actual organic change in the nerves; while secondary neuralgia is permanent and persistent, being confined to a single nerve trunk or nerve which microscopically shows definite signs of inflammation or degeneration. Evidently only the former or essential neuralgia is true neuralgia, and to the second form the term "neuritis" should be applied. Thus, sciatica is not truly a neuralgia, and the increasing tendency is to call that disease very properly sciatic neuritis.—CHARLES LOUIS MIX, *Northwestern Dental Journal.*

The Toothpick Evil.—The American toothpick is largely responsible for many gingival lesions. There is an abnormal condition present when the use of a toothpick becomes a necessity. Food has found a way to lodge distressingly between the teeth, and the person so afflicted should seek the services of a dentist for a correction of the evil, and not keep picking with a toothpick for mere temporary relief. Usually the dentist will find that one or both of the teeth between which the trouble occurs are more or less decayed. In filling such teeth the defect—*i.e.* the lodgment of food—may be corrected if due attention be given to proper restoration of the points of contact. If a pocket has been already formed in the alveolus, it should be treated until health is restored; but it must be noted that rarely or never does new process, with its overlying gum, build up to original and normal outlines. It does well to fairly eliminate the depression or pocket, without building up rounded-out proportions. The eschar may be healthy, but there is loss of tissue that will not be regenerated to former outlines.—R. B. TULLER, *American Dental Journal.*

Temperamental Characteristics of Teeth.—Art, as applied to the making of artificial dentures, consists in the closest possible imitation of nature. This is an intricate matter requiring patient observation, close study, and the acquirement of great skill. There is no general formula for making artistic artificial dentures. Neither is there any special type of artificial dentures which may be called artistic. Nature is infinite in her variety. She never produces two beings exactly alike; every complete piece of her handiwork differs in some particular from every other piece. And yet she has a consistent plan for everything she creates; each of its parts is significant; all taken together are in harmony.

In endeavoring to imitate nature, the creator of artificial dentures must study carefully the individual variations of his patients, and it will be well for him if he also familiarize himself with the truth that while individuals differ, there is still an underlying unity of plan in their structure. From this it follows that individuals of a certain type have certain common peculiarities; while individuals of another type have certain other prominent peculiarities.—IRA BENSON SELLERY, *Northwestern Dental Journal.*

Accurate Method of Shading Inlays.—In the selection of colors for an inlay note the variation in color of the natural tooth. There are usually three or more colors, or shades of colors, in a tooth. The foundation of an inlay, representing the dentin, should be yellow (presuming that the tooth is vital), and the overlying colors should approach the color of the enamel in their respective positions. If the matrix lining is to be used, a thick layer should cover the matrix to within one-half millimeter of the margin, and be fused to a high glaze. The foundation body should be applied over the white porcelain, and be contoured to replace the dentin. It should be fused, provided it be of a higher-fusing porcelain than that used to replace enamel. Care should be taken to prevent porcelains of different colors from mixing, when applying them to their respective positions. If the colors are applied separately and biscuited, then a uniform color is applied over the entire mass and properly fused; the colors will be true, and the fused porcelain will approach more nearly the natural tooth-structure in appearance.—J. Q. Byram, *Dental Review.*

Disadvantages of Shell and Band Crowns.—The unfortunate consequences following the use of shell and band crowns are due, first, to the inadequate dressing and shaping of the natural crown, thus necessitating the use of a metal shell, which cannot fit at the cervical margin; and second, the forcing of the edge of the shell so far under the free margin of the gum as to impinge upon the pericementum and adjacent soft tissues. In the first case, the margin of the shell, standing away from the neck of the tooth at all points, furnishes a shelf for the accumulation of food débris and stagnant secretions, which inevitably results in the girdling of the tooth by caries; and in the second case, the soft tissues impinged upon become irritated and recede, or an inflammation is set up which very frequently leads to the establishment of a pyorrheal condition. In either case the tooth is eventually lost.

All that has here been said in regard to the ill-fitting or ill-placing of the margin of the shell crown applies equally to any band encircling the neck of the tooth, no matter what kind of a crown be attached to it. It is the observation of the ill results of the misfit band that has led to the present outcry against the use of bands in any form. Some recent writers even go so far as to declare that any band extending under the gum margin, no matter how well fitted and adapted, is in all cases a source of irritation, and therefore objectionable. Probably this is a swinging of the pendulum too far in the opposite direction; but those who now object to the use of bands certainly have some justification for their views, when we consider the immense amount of harm that has resulted from their improper use.—S. H. Guilford, *Stomatologist.*

Artistic Artificial Dentures.—There is never perfect regularity in natural teeth. Irregularity of alignment is the rule. Artistic dentistry will not be satisfied with mere anatomical correctness and perfect adaptation to mastication and speech. Each tooth must be perfectly adjusted to its function and position in the mouth. Possibly it may involve—and this is perfectly true—the rotating or elongation of the centrals, the rotation or shortening of the laterals, sometimes the rotation of the canines. Much care should be taken to see that the neck of the canine is made prominent, and that the canine eminence at the junction of the labial and buccal aspects is also well defined. This will help to restore the lost features of expression possibly more than anything else that can be done.

When there has been considerable absorption and the bite is sufficiently open, countersunk pin teeth can be used advantageously. The entire natural crown being duplicated in porcelain affords a more agreeable feeling to the tongue, and a more distinct articulation in speech; and when the mouth is open artificiality is not very noticeable. As a rule gum-section teeth are effective only where in conversation or laughing the upper lip exposes the gum. Porcelain imitates the natural gum better than any other known substance, especially when moistened with saliva.

For partial cases where much absorption has occurred in the region of the bicuspids, or where the junction between the artificial restoration and the natural gum would otherwise be apparent, gum-section teeth are also to be recommended. But they do not admit of adequate individual variations, and rarely secure good occlusion, and while they do produce a natural-appearing gum, they are in general unsuited to artistic dentistry.—Ira Benson Sellery, *Northwestern Dental Journal.*

A Universal Antidote.—A writer in a recent number of the *Pharmaceutical Era* emphasizes the use of milk as a universal antidote applicable to most cases of poisoning. By its fatty matter and its casein, it protects the mucous membrane against the corrosive action of acids, alkalies, and other caustic or irritant substances. It not only coagulates under the action of acids, by combining with them, but it also yields a precipitate with most mineral bases, forming insoluble caseates. If precipitation does not immediately take place with a product having a given reaction—acid or basic—this precipitate will appear through the intervention of another substance of contrary reaction. Dr. Crowzel proposes to add to the milk five per cent. of sodium borate. This salt is not toxic, and is employed because it precipitates as insoluble borates all the mineral bases, except harmless or slightly poisonous alkaline bases. The poisonous acids decompose it, seizing on the soda and setting free boric acid, which is less poisonous and less soluble. The mixture of sodium borate and milk is an antidote at once neutralizing and precipitant. It can be used especially with mineral poisons, although we must except cyanids, ferrocyanids, ferricyanids, chlorates, nitrates, arsenites, arsenates, and oxalates. Of these, the first three are precipitable by a mixture of ferrous and ferric sulfate, while chlorates and alkaline nitrates cannot be precipitated by any offensive reagent. Arsenites and alkaline arsenates can be eliminated by magnesia. In any case no risk is run, and good may be done by giving milk with sodium borate to one who is thought to have been poisoned. It is the first thing to be done after emptying the stomach. If arsenic is suspected, magnesia should be given. If there are vegetable poisons, the best antidote is a one per cent. solution of potassium permanganate.—*Medical News.*

Cavities in Which the Use of Porcelain is Contra=indicated and Cavities in Which it May be Advantageously Used.—On account of the brittleness of porcelain, I would not advise its use in molar teeth when the margins of the cavities are exposed to the stress of mastication; nor would I advise its use in bicuspids when the margins are so exposed. If I wanted to use this material in a bicuspid or molar, I would so prepare the cavity that the margin of the inlay would be carried beyond the area of susceptibility, for in most of the cases presented for restoration, the tooth is disintegrated to such an extent that it becomes necessary to protect the frail walls by grinding away the cusps and replacing them with the filling; especially is this true of the bicuspids. However dangerous this practice may seem, some of the most satisfactory inlays we have made are in bicuspids, when, after one to four years' service, the margins are still perfect, and the teeth apparently in as high a state of preservation as when the restoration was made. For cavities in the six anterior teeth we find porcelain more strongly indicated than for those in the posterior teeth, and indeed in the former, if we care anything for the esthetic effect of our operation, we are forced to use porcelain; consequently our attention is more strongly centered in these teeth.

Of the cavities presenting themselves in the six anterior teeth, those known as labial cavities demand the use of porcelain more than any other. Next in importance comes the simple approximal cavity, and although we see the need, from an esthetic point of view, for filling the approximal cavities, which involve the incisal, with this material, we are obliged to take into consideration the amount of stress to be brought to bear, and the direction in which it will be applied before we can safely decide what material may be used in restoration.—Craig M. Work, *Tri-State Dental Record.*

A Root=Canal Filling Material.—For some years I used gutta-percha in its several forms, but in doubtful cases I used a filling that gave me such success that I employed it more and more, until now I rarely use anything else, except when I am going to use a pin, in which case I use gutta-percha to close the foramen. This filling is a cement composed of zinc oxid and oil of cloves, and in case of large foramen, abscesses, or any doubtful cases, I add some iodoform to the mixture. I would use the latter in all cases, for I believe it to be a valuable ingredient, if it were not for its objectionable odor, and for the slight soreness which it induces, which rarely occurs when the iodoform is absent. This cement is non-irritating, is easily introduced, does not clog in the canal, does not discolor, hardens sufficiently so that it will not absorb odors, is continuously antiseptic, and in case of trouble is easily removed. I have now been using it for several years almost exclusively, and for ten years in all doubtful cases, and while I have not always had success, in my hands it has given splendid satisfaction.

In using it I put a drop or two—according to the size of the canals—of the oil of cloves on a glass slab, then draw the powder into it, thoroughly incorporating the two ingredients to the consistence of a thick paste, adding at this time a small quantity of iodoform, if I am going to use the latter at all. I then pick up a small quantity of the paste with a canal-filler, place it at the entrance of the canal, and with a small pledget of cotton about the size of a pea held in the pliers, force the paste into the canal as far as possible. With root-canal fillers I work this to the end of the canal, adding some more of the paste, and repeating the operation until the canal is filled; but during the filling I often absorb all the oil of cloves that I can with bibulous paper pledgets, making the paste as hard and firm as is practicable. This paste hardens in a short time by the tubuli absorbing the oil of cloves. I find that thick heavy oil of cloves works easier, makes a harder paste, and when it sets, leaves the canals perfectly filled with a non-irritating antiseptic filling.—Bush Jones, *Texas Dental Journal.*

HINTS, QUERIES, AND COMMENTS.

THE RETENTION OF PORCELAIN INLAYS.

Make a cylinder of the thinnest platinum foil, a little less in diameter than the depth of the cavity, and as long as can be placed in the bottom of the matrix. Close both ends of the cylinder, place it in the bottom of the matrix, and bake the inlay. When completed, remove the platinum matrix in the usual manner, and you will notice that a hollow tube has been baked in the porcelain. Now take a thin disk, cut into this tube, and with a little care all the platinum can be removed; if necessary with the additional assistance of sharp-pointed explorers. The result will be an inlay with an undercut that cannot be improved upon. The tube can be made on the end of any root-canal plugger or wire of a size suited to the particular case in hand. There is less liability of warping the matrix when these tubes are used, but this should not be the cause of the operation being carried out with less thorough attention to detail.

Ormond E. Wall, D.D.S.

Honolulu.

OBITUARY.

DR. CHARLES SIDLES BECK.

Died, December 25, 1905, at Wilkesbarre, Pa., after a short illness, Charles Sidles Beck, D.D.S., in his seventy-eighth year.

Dr. Charles S. Beck, a descendant of an old revolutionary family of Philadelphia, was himself born in that city, on November 25, 1828. Having acquired a competent preliminary education he soon commenced the study of dentistry, receiving a diploma from the Pennsylvania Association of Surgeon-Dentists, May 1, 1850. Upon the completion of his dental apprenticeship he took up the study of general medicine, and in 1853 had the M.D. degree conferred upon him by the Medical College of Pennsylvania. It never was his intention to devote himself exclusively to the practice of medicine; he undertook the study thereof solely for the purpose of better equipping himself for the work of dentistry—his chosen profession from the beginning. The Pennsylvania College of Dental Surgery in recognition of his professional accomplishments conferred upon him in 1877 the honorary degree of Doctor of Dental Surgery.

Dr. Beck was a man of superior mechanical ability, and for his artistic work in prosthetic dentistry the Franklin Institute of Philadelphia awarded him a first prize. After graduating he became associated with Dr. J. DeHaven White, a distinguished practitioner of dentistry of Philadelphia, and remained as his assistant throughout the period between his graduation and removal to Wilkesbarre. Dr. Beck had been for many years a clinical instructor at the University of Pennsylvania, where he from time to time gave interesting and instructive demonstrations on both mechanical and operative dentistry. He was an active unit in the work of dental societies throughout the country, and an enthusiastic participant in their deliberations. He was a member of the Pennsylvania State Dental Society, the Susquehanna Valley Dental Association, and the Odontographic Society of Pennsylvania. In 1900 Dr. Beck was given a complimentary dinner by the Susquehanna Valley Dental Society, of which he and the late Dr. John M. Barrett were founders. The occasion was intended to celebrate the fiftieth anniversary of his entrance into dentistry.

Dr. Beck located in Wilkesbarre some fifty-five years ago, at the suggestion of a friend, the Rev. John Dorrance, D.D., at that time pastor of the First Presbyterian church, and ever since that time had practiced uninterruptedly at the one home on North Main street.

From the time which marked the entrance of Dr. Beck into the ranks of dentistry almost to the moment when his activities ceased, he exercised uplifting and developing influences upon every phase of professional endeavor. In Wilkesbarre, the scene of his more direct activities, in its vicinity, and throughout the state and county, the profession has been benefited by the presence within its fold of a member whose efforts were invariably directed toward the accomplishment of the highest ideals. His energy was persistently bent toward disentangling dentistry from the web of empiricism which enveloped it, and to emancipate his profession from the staggering post of secretiveness against which dentistry was so heavily leaning in the earlier years of his career.

His endeavors to clothe dentistry with the elements of higher and more ennobling tendencies have borne fruit in so far as they have materially helped dentistry toward a higher plane of professionalism. Dr. Beck was indefatigable in educating the lay mind toward a more thorough appreciation of the value of skilfully rendered professional services and of the significance of the position of the altruistic practitioner among his fellowmen. The indebtedness of the profession to this distinguished practitioner is in this respect a particularly large one, and in the future when reference shall be made to what has been accomplished in the past in this phase of dentistry, the name of Charles S. Beck will be remembered as one of the noble pioneers in this humanitarian enterprise.

The personality of Dr. Beck depicted forcibly the exemplary attributes of the inner man, those innate characteristics which endeared him to all whose privilege it was to meet him, and which made of him so conspicuous a figure professionally and otherwise. A man of kind and generous impulses, of unselfish and magnanimous principles, of most friendly instincts toward those in need of sympathetic encouragement—these attributes of Dr. Beck made the lives of those near to him lighter and brighter, more attractive and useful.

The flight of years left the spirit of Dr. Beck untouched by age and still in sympathy with youth. To the younger men of dentistry he was always the good comrade, appreciative of their ambitions, helpful in their struggles, and sympathetic in their difficulties. It was this perennial youthfulness of his temperament which endeared him to his colleagues of later generations, and which made them revere him as a man besides respecting him as a teacher and guide. Many were drawn to him by this characteristic and felt its influence without being able to comprehend the source of his power over them.

He was married in 1854 to Annie Bird of Tippecanoe, Ohio, and she is left to mourn a devoted husband. They have had four children, all his three sons being graduates of the University of Pennsylvania: Virginia, wife of Ernest Parish; C. S. Beck, Jr., M.D., who died in 1893; Dr. H. M. Beck of Wilkesbarre, a practitioner of dentistry, and Dr. Horace P. Beck of Newport, R. I., also a practitioner of dentistry.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

April, May, and June, 1906.

APRIL.

Connecticut State Dental Association. Bridgeport. Two days: April 7th to 18th.

Fifth District (New York) Dental Society. Syracuse. Two days: April 10th and 11th.

Nebraska (North) Dental Association. Norfolk. April 5th.

MAY.

Alabama Dental Association. Mobile. Four days: May 8th to 11th.

Arkansas State Dental Association. Fort Smith. Two days: May 9th and 10th.

California State Dental Association. San Francisco. Five days: May 14th to 18th.

Florida State Dental Association. Atlantic Beach. Three days: May 16th to 18th.

Illinois State Dental Society. Springfield. Three days: May 8th to 10th.

Iowa State Dental Society. Des Moines. Three days: May 1st to 3d.

Kansas Dental Association. Topeka. Three days: May 10th to 12th.

Lake Erie Dental Association. Cambridge Springs, Pa. Three days: May 15th to 17th.

Nebraska State Dental Society. Omaha. Three days: May 15th to 17th.

New Hampshire Dental Society. Plymouth. Two days: May 8th and 9th.

New York State Dental Society. Albany. Two days: May 11th and 12th.

Oklahoma Dental Association. Oklahoma City. Three days: May 14th to 16th.

Southern Wisconsin Dental Association. Milwaukee. Two days: May 30th and 31st.

Tennessee State Dental Association. Nashville. Three days: May 15th to 17th.

Vermont State Dental Society. Brattleboro. Three days: May 16th to 18th.

JUNE.

American Medical Association—Section on Stomatology. Boston, Mass. Four days: June 5th to 8th.

Georgia State Dental Society. Savannah. June 19th.

Indiana State Dental Association. West Baden and French Lick Springs. Three days: June 26th to 28th.

Kentucky State Dental Association. Louisville. Three days: June 12th to 14th.

Massachusetts Dental Society. Boston. Four days: June 5th to 8th.

Minnesota State Dental Association. Minneapolis. Three days: June 11th to 13th.

Mississippi Dental Association. Gulfport. Three days: June 6th to 8th.

Missouri State Dental Association. Springfield. Three days: June 5th to 7th.

Texas State Dental Association. Galveston. Three days: June 14th to 16th.

Examiners' Meetings.

Arkansas Board of Dental Examiners. Fort Smith. May 8th and 9th.

Florida Board of Dental Examiners. Jacksonville. June 8th to 12th.

Idaho Board of Dental Examiners. Boise City. June 13th to 15th.

Illinois Board of Dental Examiners. Chicago. June 4th.

Kansas Board of Examiners. Topeka. May 7th to 9th.

Maryland Board of Dental Examiners. Baltimore. May 14th and 15th.

Minnesota Board of Examiners. Minneapolis. May 3d to 5th.

Missouri Board of Dental Examiners. Kansas City, May 14th; St. Louis, May 28th.

New Hampshire Board of Registration. Manchester. June 13th to 15th.

New Jersey Board of Dental Examiners. Trenton. July 9th to 13th.

Oklahoma Board of Examiners. Oklahoma City. May 15th to 17th.

Tennessee Board of Dental Examiners. Nashville. May 15th to 17th.

NATIONAL DENTAL ASSOCIATION.

Committee on Dental History.

At the Buffalo meeting of the National Dental Association, the Committee on History of Dentistry reported to the association that Dr. Vincenzo Guerini of Naples, Italy, had written a History of Dentistry from the earliest times down to the beginning of the nineteenth century, which work is in the hands of the committee, having been translated into English and fully revised and edited. Dr. Guerini has generously placed the publication of this great work under the patronage of the National Dental Association in token of his appreciation of American dental development. In order that the work may be published without financial loss it is necessary that about 700 subscriptions for copies at $5.00 each be obtained before contracts for printing, binding, and publishing the work can be entered into, and the duty of securing these advance subscriptions has been assigned to the Committee on History of Dentistry of the National Dental Association.

The committee believes that the general and growing interest in the history of our profession is a sufficient warrant for this undertaking. Our historical records are scattered through a vast literature and much of it is of great antiquity. These data have never before been gathered together and arranged in a consequential logical order. Dr. Guerini has spent many years of his professional life and large amounts of money in collecting the material for this work. It has involved the searching of libraries and museums, the translation of many old documents and publications, and the digesting and arranging of this matter into proper form. As an historical writer the distinguished author needs no introduction, as his contributions on dental history in our magazines are well known, and their excellence is an earnest of the excellent and exhaustive character of his larger work now in the hands of the Committee on History of Dentistry for publication.

The importance and value of dental art and science as a humane service is well recognized, but we are so accustomed to view this question from the modern standpoint that we, generally speaking, overlook the immense work done by our predecessors, reaching far back in unbroken line to the mists of antiquity. It was they who laid the foundations upon which modern dentistry has been built, and no man can peruse the record of their efforts as set forth in Dr. Guerini's book without developing a higher appreciation of their work and a keener realization of the worth and dignity of the calling which they in common with ourselves followed.

It is the desire of the committee having this matter in charge to secure as promptly as possible the subscriptions necessary before the work can be published. We ask you to consider this as a personal appeal to forward your subscription for the work to Dr. Charles S. Butler, The Frontenac, Buffalo, N. Y., who, with the treasurer of the National Dental Association, Dr. V. E. Turner, Raleigh, N. C., will act as custodian of the publication fund.

Announcement will be from time to time made in the dental journals of the growth of the subscription list and the progress of the work of publication. The sooner the required 700 names are obtained, the sooner the work can be issued. The volume, it is estimated, will comprise about 500 pages. It will be profusely illustrated, and bound in cloth.

In case this proposed publication meets with the success which it merits, a second and companion volume, treating of the more modern aspect of dentistry, will probably be issued under the same auspices and conditions.

Edward C. Kirk, Philadelphia.
Wm. H. Trueman, Philadelphia.
Gordon White, Nashville, Tenn.
H. L. Ambler, Cleveland, Ohio.
Jas. McManus, Hartford, Conn.
J. Y. Crawford, Nashville, Tenn.
A. H. Fuller, St. Louis, Mo.
S. A. Freeman, Buffalo, N. Y.
W. E. Boardman, Boston, Mass.
Charles S. Butler, Buffalo, N. Y.
Burton Lee Thorpe, *Sec'y*, St. Louis, Mo.
Chas. McManus, *Chairman*, Hartford, Conn.

NORTH NEBRASKA DENTAL ASSOCIATION.

The second semi-annual meeting of the North Nebraska Dental Association will be held at Norfolk, Neb., April 5, 1906.

C. S. Parker, *Sec'y*, Norfolk, Neb.

"F. D. I."

COMMISSION ON MILITARY AND NAVAL DENTAL SERVICE.

(*Created by resolution of the Fourth International Dental Congress.*)

THE following appointments were confirmed at the meeting of the Executive Council of the International Dental Federation held at Hanover, Ger., August 7, 1905:

DONNALLY (WILLIAMS), *Chairman*, 1018 Fourteenth st., Washington, D. C., U. S. A.
SAUVEZ (E.), 17 Rue de St. Pétersbourg, Paris, France.
HADERUP (V.), 17 Amagertory, Copenhagen, Denmark.
GIURIA (MICHELI), 4-1 Via Roma, Genoa, Italy.
GUILLERMIN (L.), 53 Rue du Stand, Geneva, Switzerland.
FÖRBERG (ELOF), 24 Sturegatan, Stockholm, Sweden.
VERSLÜYSEN, 19 Rue du Fagot, Anvers, Belgium.
JESSEN (ERNST), 4 Broglieplatz, Strasburg, Alsace.
PLATSCHICK (B.), 3 Rue Ventadour, Paris, France.
RICHTER (STABSARZTA, DR.), Chemnitz, Germany.
PATERSON (Wm. B.), 7A Manchester Square, London, W.
GREVERS (JOHN), 13 Oude Turfmarkt, Amsterdam, Holland.
HARRISON (WALTER), 6 Brunswick Pl., Hove, Brighton, England.
NOBLE (JAS. W.), Hong Kong, China.
CRAWFORD (J. Y.), Jackson Bldg., Nashville, Tenn.
CHITTENDEN (C. C.), 21 West Madison st., Madison, Wis.
LIMBERG (A.), 7 Place d'Isaac, St. Petersburg, Russia.
WEISER (RUDOLF), IX Frankgasse 2, Vienna, Austria.
AGUILAR (FLORESTAN), Alcala, 72 D, Madrid, Spain.
CORTEREAL (JOAO), Rua Paschoal de Mello No. 65 r/c Lisbon, Portugal.
SMITH-HOUSKEN (O.), 4 Storthingsgade, Christiania, Norway.
WEBER (ANDRES G.), Corrales 1, cor. Egido, Havana, Cuba.
HALL (CHAS.), Blue st., Sydney, Australia.
DUBEAU (E.), 396 St. Denis st., Montreal, Canada.
CHIWAKI (M.), 9 Misakicho Nichome, Kanda, Tokio, Japan.
FALERO (JUAN), 2A Mina 4, Mexico City, Mexico.
CHAPOT-PRÉVOST, Sr. (ROD.), 102 d'Ouvidor, Rio de Janeiro, Brazil.
ETCHEPAREBORDA (N.), Calle Tacuari 355, Buenos Aires, Argentina.
PAREDES, Baranquilla, Columbia.
BURNETT (JOHN S.), Salto, Uruguay.

AMERICAN MEDICAL ASSOCIATION—SECTION ON STOMATOLOGY.

THE next meeting of the American Medical Association will be held in Boston, Mass., June 5 to 8, 1906. The program for the Section on Stomatology is as follows:

1. Chairman's Address. H. P. Carlton, San Francisco.
2. "The Structure of the Jaws of the Lower Vertebrates." J. S. Kingsley, Boston, Mass.
3. "Development of the Human Jaw." Chas. L. Minot, Chicago.
4. "Palates of the Feeble-minded." Walter Channing, Brookline, Mass.
5. "The Reflexes of Dentition from the Physician's Standpoint." Chas. Hunter Dunn, Boston, Mass. Discussion opened by Thos. Morgan Rotch, Boston, and A. C. Cotton, Chicago.
6. "Gingival Manifestations of Metabolic Disorders." Alfred C. Croftan, Chicago.
7. "Interstitial Gingivitis Produced by Auto-intoxication as Indicated by the Urine and Blood Pressure." Eugene S. Talbot, Chicago.
8. "Treatment of Loosened Teeth." M. L. Rhein, New York city.
9. "Conservatism in the Treatment of Infants with Hare-lip and Cleft Palate." G. V. I. Brown, Milwaukee, Wis.
10. "Conservative Surgery of the Lip." Thos. Fillebrown, Boston.
11. "The Prevention of Disfiguring Scars About the Face." M. I. Schamberg, Philadelphia.

12. "Some Pathologic Features of the Pulp." V. A. Latham, Chicago.

13. "The Relation of Systemic Diseases to the Conditions of the Oral Cavity." James E. Power, Providence.

14. "Medical Phases of Dental Disorders." Samuel A. Hopkins, Boston.

15. "The Botanical Diagnosis of Leptothrix Racemosa and Its Relations to the Modern Doctrine of Bacteriology." Filandro Vicentini, Chieti, Italy.

16. "Practical Innervation of the Trifacial Nerve." M. H. Fletcher, Cincinnati, Ohio.

17. "Practical Ethics." George F. Eames, Boston.

18. "Two Cases of Infantile Scurvy." Alice M. Steeves, Boston.

H. O. Carlton, *Chairman.*
Eugene S. Talbot, *Sec'y,*
Chicago, Ill.

The Massachusetts State Dental Society will hold a joint meeting with the Section on Stomatology.

Those wishing to join the American Medical Association, Section on Stomatology, may do so by writing to the secretary for blank to be filled out and signed by the present president and secretary of their state or local dental society. Inclose this with five dollars ($5.00), and send to the secretary of the Section on Stomatology.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The twenty-fourth annual meeting of the National Association of Dental Examiners will be held at the New Kimball House, Atlanta, Ga., September 14th to 17th, commencing 10 A.M., Friday, September 14, 1906.

The rates per day will be, European plan, from $1.50 to $4.00, American plan, from $3.00 to $6.00, governed by choice of rooms.

The convention hall is in the hotel, and every effort will be made by the proprietors for the care and comfort of the members.

Arrangements are being perfected for those desiring a short ocean trip at reduced rates, via the Clyde and Old Dominion steamship lines, notice of which will be given by circular later.

Chas. A. Meeker, *Sec'y,*
29 Fulton st., Newark, N. J.

AMERICAN DENTAL SOCIETY OF EUROPE.

The next meeting of the American Dental Society of Europe will be held at Berlin, Germany, August 1, 2, 3, and 4, 1906. A most cordial invitation is extended to members of the profession to be present.

An interesting program is already assured, and it is hoped to make this one of the most interesting and largely attended meetings in the history of the society.

Geo. O. Webster, *Hon. Sec'y,*
Pariser Platz I, Berlin, Germany.

KANSAS CITY DENTAL SOCIETY.

The Kansas City (Mo.) Dental Society has appointed a committee to arrange for a great dental clinic, to be held February 22 and 23, 1907.

The committee is represented by Dr. J. P. Root, as president and the following chair men: Essays—J. D. Patterson. Reception—D. J. McMillen. Clinics—F. G. Worthley. Smoker—C. L. Hungerford. Exhibits—T. E. Purcell. Finance—C. L. Van Fossen. Program—M. C. Carpenter. Publication—J. W. Hull. Arrangements—R. M. Seibel. Railroads—F. W. Franklin.

The chairmen of the different committees have been at work, even at this early date, and have arranged for quarters at the Midland, having secured the large banquet hall for the clinics, and enough other space for the exhibits, etc. Everything is being planned to make this greater than all former clinics.

The clinicians will be selected from among the most prominent men in their respective lines. One evening will be devoted to essays, limited to two in number, and will be given by men well known in scientific dentistry. A complimentary banquet will be given the clinicians and essayists by the local dentists.

The committeemen back of this undertaking realize its magnitude, and expect to exercise the necessary energy to push it to a successful end. All ethical dentists and dental societies are requested to keep the dates in mind and to co-operate in making this a great dental gathering and the greatest of all practical dental clinics.

J. W. Hull,
Ch'man Pub. Committee.

FIFTH DISTRICT (N. Y.) DENTAL SOCIETY.

THE thirty-eighth annual meeting of the Fifth District Dental Society of the State of New York will be held at the Vanderbilt Hotel, Syracuse, N. Y., April 10 and 11, 1906.

W. H. LEAK, *Cor. Sec'y*,
Watertown, N. Y.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE forty-second annual convention of the Connecticut State Dental Association will be held at Bridgeport, Conn., Tuesday and Wednesday, April 17 and 18, 1906. There will be papers by Dr. E. C. Kirk, Philadelphia; Dr. C. S. Butler, Buffalo, N. Y.; Dr. V. H. Jackson, New York; Dr. J. E. Nyman, Chicago, Ill., and forty-four clinics. Members of the dental societies of the adjoining states and of New York city are invited to attend.

F. HINDSLEY, *Sec'y*,
Bridgeport, Conn.

OKLAHOMA DENTAL ASSOCIATION.

THE sixteenth annual meeting of the Oklahoma Dental Association will be held in Oklahoma City, Okla., May 14, 15, and 16, 1906. The profession is cordially invited to attend. Dental manufacturers' exhibits are desired. For particulars address

C. L. WHITE, *Sec'y*,
208 Bassett bldg., Oklahoma City, Okla.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

THE twentieth annual meeting of the Southern Wisconsin Dental Association will be held at Milwaukee, Wis., May 30 and 31, 1906.

Special stress will be laid on the clinical part of the meeting, as we are going to try and make it one of the largest the state has ever held. Some of the best clinicians are coming from our border states, and we are looking for a rousing good meeting. All ethical practitioners are cordially invited to meet with us.

C. W. COLLVER, *Sec'y*,
Clinton, Wis.

CALIFORNIA STATE DENTAL ASSOCIATION

AND THE

Alumni Association of California University, Dental Department.

THE California State Dental Association and the Alumni Association of the Dental Department of the University of California will hold a joint session and clinic at San Francisco, Cal., May 14 to 18 inclusive, 1906.

C. E. POST, *Recording Sec'y*,
San Francisco, Cal.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-eighth annual meeting of the New York State Society will be held in Albany, May 11 and 12, 1906, when the following program will be presented:

President's Address, Dr. W. J. Turner; Report of the Correspondent, Dr. Ellison Hillyer; Report of Committee on Practice, Dr. E. Howard Babcock; Report of Committee on Scientific Research, Dr. F. W. Low. Essayists: Dr. Edward C. Kirk, Philadelphia; Dr. J. Q. Byram, Indianapolis, Ind.; Dr. H. A. Pullen, Dr. G. B. Mitchell, and Dr. W. B. Dills, Buffalo, N. Y.

In addition to the above a large number of special clinics will be given. The sessions will be held in the Assembly Hall of Hotel Ten Eyck, and a very cordial invitation is extended to all reputable members of the profession to attend the meeting. Trunk-line association rates on all railways.

CHARLES S. BUTLER, *Sec'y*,
The Frontenac, Buffalo, N. Y.

Any ethical member of the profession having anything of interest to present, or desiring to clinic, will kindly communicate with the Clinic Committee, as follows:

F. MESSERSCHMITT, *Chairman*,
1023 Granite bldg., Rochester, N. Y.
W. D. TRACY,
46 W. 51st st., New York city.
G. B. MITCHELL,
448 Porter ave., Buffalo, N. Y.
G. A. SULLIVAN,
18 Dove st., Albany, N. Y.
F. W. PROSEUS,
238 Monroe ave., Rochester, N. Y.

NEW YORK COLLEGE OF DENTISTRY.

ANNIVERSARY—CLASS OF '96.

THE class of 1896 of the New York College of Dentistry will celebrate its tenth anniversary in May 1906.

GUSTAVE R. STEIN, *Chairman*,
New York city.

NEW HAMPSHIRE DENTAL SOCIETY.

THE twenty-ninth annual session of the New Hampshire Dental Society will be held at the Pemigewassett House, Plymouth, N. H. (Gateway to the White Mountains), May 8 and 9, 1906.

F. F. FISHER, *Sec'y*,
Elm st., Manchester, N. H.

LAKE ERIE DENTAL ASSOCIATION.

THE annual meeting of the Lake Erie Dental Association will be held at the Hotel Rider, Cambridge Springs, Pa., May 15, 16, and 17, 1906.

Round trip excursion rates on all roads may be procured.

The committees are working hard to make this an extra-fine meeting. All ethical dentists are cordially invited to attend.

V. H. MCALPIN, *Sec'y*, Warren, Pa.

BALTIMORE COLLEGE OF DENTAL SURGERY ALUMNI ASSOCIATION.

THE Alumni Association of the Baltimore College of Dental Surgery will hold its reunion at the college building, Baltimore, Md., May 10 and 11, 1906.

The Committee has endeavored to reach by letter every graduate it has been able to locate. Those who have not received preliminary notice of this reunion are requested to send their addresses to the secretary, so that they may receive an official program.

An interesting program is being arranged, consisting of clinics and papers by men of exceptional ability, also reunion of classes and alumni dinner. All ethical members of the profession are cordially invited to attend.

W. W. DUNBRACCO, *Sec'y*,
327 N. Charles st., Baltimore, Md.

IOWA STATE DENTAL SOCIETY.

THE forty-fourth annual meeting of the Iowa State Dental Society will be held at Des Moines, Iowa, May 1, 2, and 3, 1906.

C. W. BRUNER, *Sec'y*, Waterloo, Iowa.

KANSAS STATE DENTAL ASSOCIATION.

THE next annual session of the Kansas State Dental Association will be held in Topeka, May 10, 11, and 12, 1906. Dr. J. E. Nyman of Chicago, Ill., and Dr. Geo. Edwin Hunt, of Indianapolis, Ind., will be present as our guests.

All ethical dentists are cordially invited to attend.

F. O. HETRICK, *Sec'y*.
Ottawa, Kans.

NEBRASKA STATE DENTAL SOCIETY.

THE thirtieth annual meeting of the Nebraska State Dental Society will be held in Omaha, May 15, 16, and 17, 1906, at the Creighton Dental College. Dr. L. P. Haskell and Dr. J. N. MacDowell, both of Chicago, will be with us, and the indications are that we will have the best meeting in the history of the society. A cordial invitation is extended to all reputable practitioners to attend.

M. E. VANCE, *Corr. Sec'y*,
Lincoln, Neb.

ST. LOUIS DENTAL COLLEGE.

ALUMNI ASSOCIATION—ANNUAL CLINIC.

THE annual clinic and class reunion of the Alumni Association of the St. Louis Dental College will be held in St. Louis, May 7 and 8, 1906. The various committees have been working energetically, each in its different line, and report that this will be the largest clinic given by the association. The committee on essays have a number of valuable and original papers. The committee on clinics have already secured eighty-five interesting clinics, and expect to have one hundred on the day of the clinic.

R. O. BUTTS, *Sec'y*,
St. Louis, Mo.

ARKANSAS STATE DENTAL ASSOCIATION.

THE Arkansas State Dental Association meets May 9 and 10, 1906, at Fort Smith, Ark. The State Board of Examiners meets May 7 and 8, 1906.

HENRY P. HOPKINS, *Sec'y.*

KENTUCKY STATE DENTAL ASSOCIATION.

CHANGE OF PLACE AND DATE.

THE next annual meeting of the Kentucky State Dental Association will convene at Louisville, Ky., June 12, 13, and 14, 1906. We anticipate a most pleasant as well as a profitable meeting, and a cordial invitation is extended to the profession. A big meeting expected. Send subject of paper or clinic, or both, immediately to

W. M. RANDALL, *Sec'y,*
Cor. Brook and B'way,
Louisville, Ky.

TEXAS STATE DENTAL ASSOCIATION.

THE twenty-sixth annual meeting of the Texas State Dental Association will be held in the city of Galveston, Texas, June 14, 15, and 16, 1906.

The indications are that this meeting will be the best ever held in Texas. All ethical practitioners are extended a cordial invitation to meet with us.

BUSH JONES, *Sec'y*, Dallas, Texas.

VERMONT STATE DENTAL SOCIETY.

THE thirtieth annual meeting of the Vermont State Dental Society will be held at Brattleboro, Vt., May 16, 17, and 18, 1906.

It is expected that we will have the largest attendance of any meeting ever held by this society. All the leading manufacturers have signified their intention of making an exhibit of their products, and this adds greatly to the success of a convention.

Every progressive dentist should be present. Special social features for Thursday evening.

THOMAS MOUND, *Sec'y,*
Rutland, Vt.

MINNESOTA STATE DENTAL ASSOCIATION.

THE twenty-third annual meeting of the Minnesota State Dental Association will be held in Minneapolis, Minn., at the Dental Department of the State University, on June 11, 12, and 13, 1906.

J. F. MCCREA, *President.*
F. E. COBB, *Sec'y,*
Minneapolis.

TENNESSEE STATE DENTAL ASSOCIATION.

THE next meeting of the Tennessee State Dental Association will be held in Nashville, Tenn., May 15, 16, and 17, 1906.

CHAS. A. TAVEL, *Sec'y,*
Memphis, Tenn.

MISSOURI STATE DENTAL ASSOCIATION.

THE forty-first annual meeting of the Missouri State Dental Association will be held at Springfield, Mo., June 5, 6, and 7, 1906.

An unusually interesting program is being arranged. A number of men eminent in the profession have signified their intention of being present and the meeting promises to be the best in the history of the association.

All ethical dentists are cordially invited to be present.

SAM T. BASSETT, *Cor. Sec'y.*
St. Louis, Mo.

ALABAMA DENTAL ASSOCIATION.

THE next annual meeting of the Alabama Dental Association will be held in the Commercial Club rooms, Mobile, Ala., May 8 to 11, 1906. A most interesting program is being prepared, and all the leading manufacturers will have exhibits.

A full attendance on the part of the members is urged, and a cordial invitation is extended to all ethical non-association dentists in the state, and to our professional brethren from other states. The usual reduced railroad rates on the certificate plan will be secured.

L. A. CRUMLEY, *Sec'y,*
401 Jefferson Co. Bank bldg.,
Birmingham, Ala.

GEORGIA STATE DENTAL SOCIETY.

The next annual meeting of the Georgia State Dental Society will be held June 19, 1906, at Savannah, Ga. This change in time of meeting is to avoid conflict with the Florida Association and for the convenience of manufacturers. Also for other reasons, it has been considered advisable. The original dates set for this meeting were June 12th to 14th inclusive.

S. H. McKee, *President.*

FLORIDA STATE DENTAL SOCIETY.

Change of Date.

The twenty-third annual meeting of the Florida State Dental Society will be held at the Continental Hotel, Atlantic Beach (near Jacksonville), Wednesday, May 16, 1906, continuing in session three days.

All ethical practitioners are most cordially invited to be present. An interesting program has been arranged. A number of special clinics will be provided.

Carroll H. Frink, *Cor. Sec'y,*
Fernandina, Fla.

MISSISSIPPI DENTAL ASSOCIATION.

The thirteenth annual meeting of the Mississippi Dental Association will be held in Gulfport, June 6, 7, and 8, 1906.

All ethical practitioners of this and other states are cordially invited to attend. Every effort is being made to have this the largest and most profitable meeting ever held, and the pleasures of Gulfport, on the coast, at this time of year, alone form a special feature.

Reduced hotel accommodations and the usual reduced rates on all railroads will be obtained.

For complete details address

E. Douglas Hood, *Sec'y,*
Tupelo, Miss.

NEW JERSEY STATE DENTAL SOCIETY.

Clinical Conference.

An opportunity is afforded anyone having a difficult case in surgery, orthodontia, operative or prosthetic dentistry, to present the case for consultation at the coming meeting at Asbury Park, N. J. It is hoped that advantage will be taken of this chance to gain the opinion and advice of men of exceptional ability in their special lines.

Correspondence is solicited. The committee desires a concise history of the cases on or before May 30th, if possible.

J. G. Halsey, *Chairman,*
Swedesboro, N. J.

INDIANA STATE DENTAL ASSOCIATION.

The forty-eighth annual meeting of the Indiana State Dental Association will be held at the West Baden and French Lick Springs, Indiana, June 26, 27, and 28, 1906.

The social side of this meeting will be a feature, while the papers and clinics have promise of being the best ever given at this society.

Ethical practitioners are invited to resort, recuperate, and re-illume with us.

R. A. Adams, *Sec'y,*
Clinton, Ind.

MINNESOTA BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Minnesota State Board of Dental Examiners will be held in Minneapolis, at the Dental Department of the State University, on April 3, 4, and 5, 1906.

All applications must be in by noon, Tuesday, April 3d. Application blanks will be furnished upon request by

Geo. S. Todd, *Sec'y,*
Lake City, Minn.

KANSAS BOARD OF DENTAL EXAMINERS.

The Kansas State Board of Dental Examiners will hold a meeting in Topeka, Kans., May 7, 8, and 9, 1906, for the purpose of examining candidates who desire to practice dentistry in this state.

Applicants will be examined in regular college branches, and will also be required to demonstrate their ability in the following practical work: Gold, amalgam and cement filling, vulcanite plate, and kind of crown that is necessary for the clinic assigned. An opportunity will be given each to demonstrate his or her knowledge of working porcelain.

Materials and furnace for this will be furnished, but for all other operations the materials, small instruments, and an engine must be furnished by the candidate. All clinics will be furnished by the board. Those intending to take the examination should have their fee of $10.00 and names in the hands of the secretary by April 15th, in order that ample accommodations for each can be arranged. For further information address

M. I. Hults, *Sec'y,*
Hutchinson, Kans.

MARYLAND BOARD OF DENTAL EXAMINERS.

The Maryland State Board of Dental Examiners will meet for examination of candidates for certificates, May 14 and 15, 1906, at the dental department of the Baltimore Medical College, Baltimore, at 9 a.m.

For application blanks and all information apply to

F. F. Drew, *Sec'y,*
701 N. Howard st., Baltimore, Md.

NEW JERSEY BOARD OF REGISTRATION.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in Trenton, N. J., on July 9, 10, 11, 12, and 13, 1906. Practical and theoretical work must be all completed at that time. Sessions begin promptly at 9 a.m. each day. All applications must be in the hands of the secretary by July 1st.

For further information kindly address

Charles A. Meeker, *Sec'y,*
29 Fulton st., Newark, N. J.

FLORIDA BOARD OF DENTAL EXAMINERS.

The regular annual meeting of the Florida State Board of Dental Examiners for the examination of applicants will be held in Jacksonville, Fla., June 8, 9, 11, and 12, 1906.

Applicants will be examined in the regular college branches, and will also be required to do practical work in filling with gold, amalgam, cement, and crown and bridge work. Applicants must furnish the instruments. Only graduates of reputable dental colleges will be admitted to examinations. It will, therefore, be absolutely necessary for each applicant to exhibit his diploma before examination begins. Absolutely no interchange of licenses with any state.

If applicants wish to take advantage of reduced railroad rates, they should buy tickets to Atlantic Beach.

W. G. Mason, *Sec'y,*
Tampa, Fla.

OKLAHOMA BOARD OF DENTAL EXAMINERS.

There will be a meeting of the Oklahoma Board of Dental Examiners held at Oklahoma City, May 15, 16, and 17, 1906, for the purpose of examining candidates. For particulars of examination and blanks address

A. C. Hixon, *Sec'y,*
Guthrie, Okla.

NEW HAMPSHIRE BOARD OF REGISTRATION.

The annual meeting and examination of the New Hampshire Board of Registration in Dentistry will be held in Manchester, N. H., June 13, 14, and 15, 1906.

A. J. Sawyer, *Sec'y,*
Manchester, N. H.

MISSOURI BOARD OF DENTAL EXAMINERS.

The Missouri State Board of Dental Examiners will meet for the examination of applicants for registration at Kansas City May 14, and at St. Louis May 28, 1906. For further particulars inquire of

S. C. A. Rubey, *Sec'y,*
Clinton, Mo.

IDAHO BOARD OF DENTAL EXAMINERS.

The Idaho Board of Dental Examiners meets in Boisé City, June 13, 14, and 15, 1906, for the purpose of examining applicants for license to practice dentistry in Idaho. Second day devoted to practical operative dentistry, applicants furnishing instruments and material.

C. E. M. Loux, *Sec'y,*
Pocatello, Idaho.

ILLINOIS BOARD OF DENTAL EXAMINERS.

THE next regular meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held in Chicago, at the Northwestern University Dental School, southeast corner of Lake and Dearborn streets, beginning Monday, June 4, 1906, at 9 A.M.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: (1) Any person who has been engaged in the actual, legal, and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (2) is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university; or (3) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee is twenty dollars ($20.00) with the additional fee of five dollars ($5.00) for a license.

Address all communications to

J. G. REID, *Sec'y*,
1204 Trude bldg., Chicago, Ill.

* * *

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING FEBRUARY 1906.

February 6.

No. 811,848, to EDSON L. HUTCHINSON. Dental clamp.

No. 811,849, to EDSON L. HUTCHINSON. Dental separator.

No. 811,864, to WILLIAM L. MOORE, *and* EDSON L. HUTCHINSON. Dental and surgical obtunder.

February 13.

No. 812,328, to WILLIAM CRENSHAW. Dental matrix.

No. 812,395, to FREDERICK S. BELYEA. Portable dental furnace.

No. 812,567, to JAMES W. IVORY. Dental instrument holder.

February 20.

No. 812,976, to GEORGE T. CARPENTER. Dental tool for removing crown pins.

No. 813,178, to EDWARD E. SMITH and HARRY F. JONES. Slip-joint connection for dental handpieces.

No. 813,344, to CHARLES S. BIRT. Inhaler.

No. 813,348, to HARRY SANFORD BURTON. Grinding stone and disk employed in mechanical and operative dentistry.

DR. CHARLES F. ALLAN.

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ORIGINAL COMMUNICATIONS.

THE QUESTION OF EXTRACTION IN ORTHODONTIA.

(Continued from page 389.)

By CALVIN S. CASE, D.D.S., M.D., Chicago, Ill.

(II.)

AMONG the many contributions to the symposium on the question of "Extraction" at the meeting of the Second District Dental Society of New York February 13, 1905, there was one presented by Dr. Varney E. Barnes of Cleveland, Ohio, which to those who had the slightest conception of the very simplest laws of facial perfection must have seemed at least amusing, unless pity was aroused because of the honest verdancy of the effort. As it was intended to expose what he believes is a fair sample of mistakes in the conservative practice of extraction in my practice—which no one of my friends answered in my absence—and as the said Dr. Barnes figures quite prominently as one of the exponents of the "new school" teaching of non-extraction, I am constrained to take up the gantlet to show just how easy a thing it is for inexperience to overshoot the mark, especially when coupled with no absolute knowledge of the case in question.

In the discussion of both my papers, read before the last meetings of the International and National conventions, he was on his feet in strong opposition to my claims. At the National his remarks were illustrated with a series of lantern projections, which seem to be for the purpose of exhibiting what he had accomplished in the practice of orthodontia, and which were so foreign to the subject in hand—which was confined to open- and close-bite malocclusion—that the chairman of the section called him to order. Among other far-fetched exhibits, he at this time again threw upon the screen cases of mine which he had exhibited a few weeks before at the New York symposium to which I refer, for the sole purpose in both instances of showing that I had made a couple of mistakes over ten years ago in extracting the two first bicuspids. To speak exactly, the said teeth were extracted in those cases in December 1893 and May 1894.

I consider it a great compliment that out of all of the many cases of dento-facial deformities which I have published within the past fifteen years, many of which were far from satisfactory to me, he could find only two which seemed to him to be so bad that he felt it his duty to enlighten the profession in regard to them, so that future generations of orthodontists would not be misled into extracting teeth for the correction of similar cases.

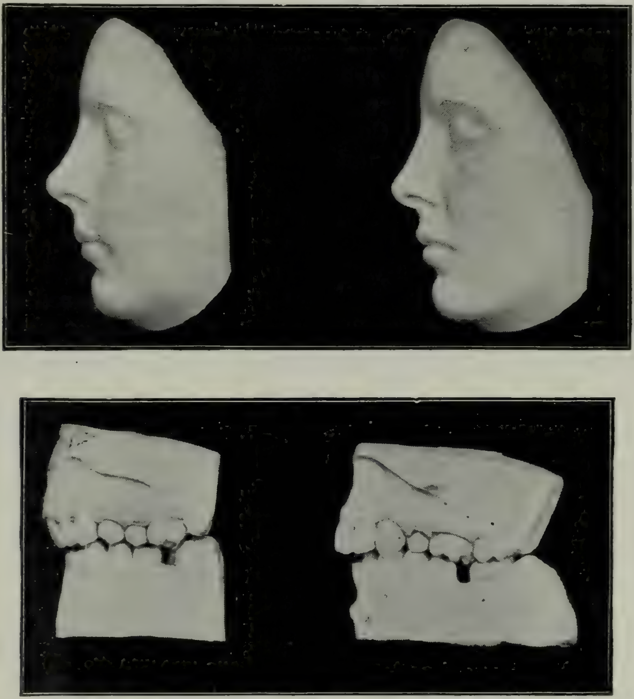
I am free to confess that I have made many mistakes along this line in my earlier practice, some of which have caused me so much chagrin that I have lain awake nights thinking about them. But this did not happen in either of these cases. In fact, there is nothing I have ever accomplished in my entire practice of which I have had greater reason to feel proud. Had Dr. Barnes or any inexperienced orthodontist chosen to criticize the treatment of any other two cases of my practice he could not have fallen into greater errors. This I will attempt to show by the pictures alone, though, as I said, when I first presented these and other cases, "The plaster casts, and especially the illustrations made from the casts, fail to do justice to the actual conditions both before and after treatment." This is true of a large proportion of cases. We need to see the patients themselves and watch their features in repose and action, in order to fully appreciate real conditions and results.

I was foolish enough, once, to criticize the results of a case of Dr. Kingsley's from the illustrations, but I have always been ashamed of it. It would not be difficult to severely criticize, from an artistic standpoint, a number of the dento-facial results which are shown by the pictures of the said symposium by the non-extractionists. If their illustrations are true, such results would never satisfy me. The illustrations of any case do not *prove* conditions or results, and should never be so considered. They are for the sole purpose of more clearly illustrating the claims of the author or the assertions of the text.

We are supposed to be gentlemen, and if one is not to be believed, no printed illustration of a plaster cast or photograph of a patient can prove the truth of an assertion. We often hear the childish expression that a plaster cast made from plaster instead of a plastic impression of the upper and lower teeth taken separately, is the only scientific method of showing the occlusion. Such things could never be rightfully regarded as scientific data to prove exact conditions of occlusion, because it is easy enough to juggle the occlusion of the casts into almost any desired position preparatory to taking the photograph for a lantern slide or cut. For that matter it is not impossible, for one who is so inclined, to slightly change the casts, or negatives made from casts or made directly from the patient. We simply have to take the word of the man who presents them, and when we arrive at a point in our professional career where we express doubts openly or otherwise as to the honesty of another who has the unbounded respect of his immediate *confrères,* and about some case of which we know nothing personally, we are unfit to practice in an honorable profession like dentistry.

One of the most contemptible practices of a certain class of professional beings who do not deserve the name of *men* is to cast underhand slurs, by word of mouth or by private letters, against the honesty of *confrères* who happen to be more successful, or who accomplish results which they themselves are unable to obtain by their own methods; who never come out openly and frankly attack one face to face, as Dr. Barnes has done, nor make the slightest effort to inform themselves as to the truth of their statements, by visiting one's office and becoming acquainted with his work and his patients. I speak feelingly in regard to this because I happen to know that I have been, from time to time, a victim of this sort of low-knocking. It therefore gives me pleasure to be able to say at this time to those who have fallen under such influences, that *I have the respect and confidence of all the better class of dentists* (so far as I know) *in my own town*—men who for years have referred their patients to me and know what I am doing. These doubters would be—as all dentists have always been—welcomed into the inner precincts of my office, with the privilege of personally examining every case presented. They would then have the opportunity of seeing impressions taken of the teeth and face, many of which I do not see until mounted in their boxes—this work being performed mostly by my able corps of assistants.

FIG. 19.



Hoping I may be pardoned for this digression, I will return to the said two cases which Dr. Barnes has chosen to so frankly criticize.

The case shown in Fig. 19 was described in a paper read before the Odontological Society of New York, March 19, 1895, and published in the *International Dental Journal* as follows: "Miss R., age twenty-two, commenced treatment December 17, 1893; staying bands October 3, 1894. The unusual time required for this operation was due to the age of the patient, and consequent impossibility of effecting a more rapid movement of the teeth. It will be observed by an examination of the casts that the first superior bicuspids were removed and the space subsequently closed—not so much by a backward movement of the crowns of the anterior teeth as by a forward movement of the molars, due to the great anchorage force they were obliged to sustain. It will also be observed by a careful examination (see Figs. 1 and 2), that the cervical portions of the incisors have not materially changed their relative position, though the apices of their roots must have moved back at least three-eighths of an inch, judging from the present inclination of these teeth and the marked depression of the covering tissues as compared with the first casts. The cuspids did not originally stand at the same inclination as the incisors, nevertheless it will be observed that the roots of these teeth, which always offer the greatest resistance, have moved appreciably. What to me is more to the point and of infinite importance, compared with the correction of the dental irregularity, is the remarkably beautifying effect produced on the face of the patient by this slight change, which, I must say, the models inadequately express. For further proof of this statement, I am pleased to be able to refer you to a man whom you all know, Dr. A. W. Harlan, who referred the case to me."

The second case (Fig. 20) was described in a paper read before the Tri-State dental meeting at Detroit, June 1895, and published in the DENTAL COSMOS, *Dental Register,* and *Ohio Dental Journal,* as follows:

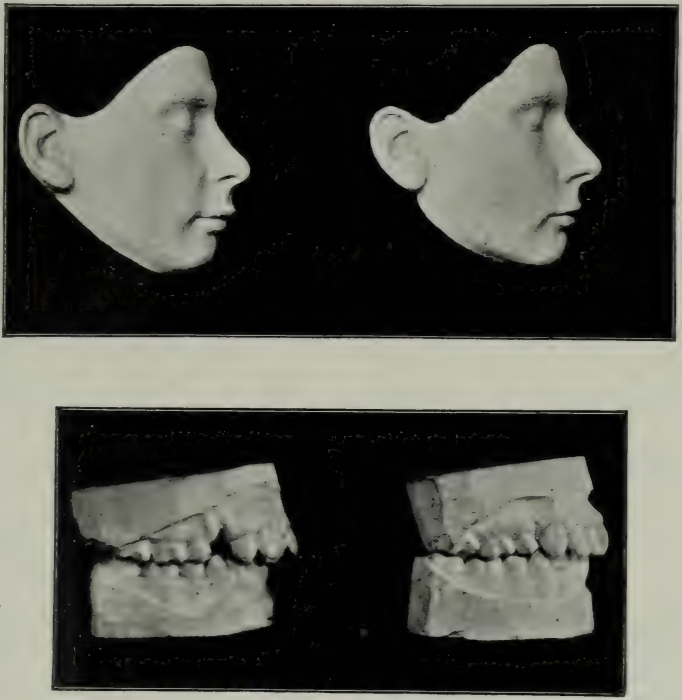
"Case II is that of a young man who was eighteen years of age when I commenced treatment, a little over one year ago. The teeth are large and strong; jaws and bones proportionately large and rigid. The facial prominence or bulging of the face in the region of the wings of the nose was quite pronounced—unfortunately due largely to the anterior position of the roots of the canines. This condition, more or less intensified, is not an uncommon one. If you have not often observed it among your patients and others, it is because you have not learned to classify it among the conditions which demand your skill; inasmuch as the teeth of these patients are often in proper alignment, through long habit and avocation you proceed to treat them with little heed to the facial defect which their position produces. If you think of it at all, it is merely to become conscious that the face is homely, plain, or ugly—made that way—unchangeable; and so the subject is dismissed as one which makes no appeal to you. Yet this, as well as many other facial imperfections produced by a malposition of the teeth, is a condition which if taken early can be remedied with no great difficulty; and in doing so you will confer one of the greatest of human blessings. After the first bicuspids were extracted, anchorage attachments were made for the posterior teeth as before, but the reciprocating force bars extended only to the canines. The anchorage was further reinforced in this case by rubber bands extending from the upper attachment of the canines to the posterior ends of the bar that was attached to all of the lower teeth, as has been repeatedly described by me elsewhere. The power of this apparatus was continued, from May 1894, for eight months, since which time to June 10, 1895, the incisors have been included by an extension of the force bars. I removed the apparatus at this time for the purpose of taking impressions to bring the models of the case before you in its present incomplete state.

"The bicuspid spaces have been closed partly by the forward movement of the anchorage teeth. The roots of the canines, which seemed to present an almost insurmountable resistance to far more force than I have ever employed in any other case, have moved appreciably, but not as much as I hoped. I leave it for you to judge of the improvement, which is quite marked in some particulars, not shown by the face models, and due to the regulation of the incisor teeth."

The following is Dr. Barnes' criticism which was published in *Items of Interest* for August 1905, page 632. After throwing upon the screen Fig. 19, he said: "Fig. 42 is from a photograph of a print in an essay read before the Odontological Society of New York, in which special attention is called to the esthetic appearance of the face after the treatment. Look closely at the occlusion and you will observe that it is not occlusion, but merely antagonism. Look at the face after operation; it has a heavy line posterior to the nose, and the lower lip has too great a depression in it. Before the operation, attention is called to the protrusion of the upper lip. Bicuspids were extracted and the roots of the upper canines and incisors were retruded. But it was not necessary. The face needed the filling out in the lower lip, and as proof let me point to the fact that the lower first molars had been lost and the lower teeth had shifted backward. What this case needed was the expansion of the upper arch, also the lower, and the insertion of artificial substitutes for those lost molars. How much better the face would have been then.”

In reference to Fig. 20 he said: “Fig. 43 shows another case where the upper first bicuspids had been extracted, and heavy molar and bicuspid anchorage had not been stationary enough to prevent a shifting forward. And yet the author claims that all the movement has been done in bringing backward the canines and the incisors. Look closely at the occlusion and see where the motion was. Look at the face! Is it refined? I say it is not. The profile is better, but not so the contour. With the distal movement of the upper arch and the mesial shifting of the lower, the face in this case would have the proper contour and profile. These last figures are also a direct contradiction of Dr. Case's claim that classification of malocclusion should be based on the facial deformity produced. It is easy to fall into error from such a classification. Let us classify malocclusion from the teeth, and prove it with the facial contour.”

Fig. 20.



One might be inclined to think this verdant effort was purely that of honest though mistaken artistic judgment, were it not that he seeks to strengthen his argument by a deliberate falsification of *both* of my published statements, when he says, “And yet the author claims that all the movement has been done in bringing backward the canines and the incisors.”

Now let *me* ask you to carefully examine the occlusion. In the beginning dental casts of Fig. 19, note the mesial malocclusion of the upper bicuspids in relation to the lower. If the lower teeth moved backward after the extraction of the molars, they could not have done so to a sufficient degree to jump such a perfect mal-interdigitation of the cusps. Whatever movement may have occurred in this way was only that which was permitted by a general retruding movement of all the upper teeth. This is possible, to a moderate degree, though the partial closure of the molar spaces was doubtless due mostly, as in other cases, to the mesial drifting of the back molars.

Be that as it may, it does not remove the unassailable fact that the entire upper arch was originally protruded the full width of a bicuspid, with a decided protrusion of the upper dento-facial area. In cases of this character older than twenty, with teeth crowded closely together in arches of normal width, it is simply foolish to say they can be properly corrected without extraction, and when the roots of the labial teeth are protruded in this way, or with the crowns also, it is equally foolish to assume that the apical area does not demand retruding quite as much as the crowns to properly correct the facial deformity, or that this may be accomplished with the ordinary methods of applying force to the crowns, or with other than the contouring apparatus which was first published in conjunction with the intermaxillary force in 1893. Why will not intelligent men who aim to accomplish the highest possible good in their art see these things—which require such a very ordinary quality of common sense? Why will men continue to blindly assume that the mere tipping of the crowns of the labial teeth backward or forward is sufficient to correct decided protrusions and retrusions of the apical area?—when they must know the tendency of such a force would always be toward the opposite direction of movement at the ends of the roots, which will not be restored by nature except in rare instances. And even under very favorable conditions of youth, it is not advisable to depend upon this inclination movement of the crowns where there is an extensive retrusion of the roots and intermaxillary process, especially as it can be so surely corrected by artificial force.

When this case presented, the bulging prominence along the upper part of the upper lip, almost completely obliterating the naso-labial lines, flaring the nostrils and forcing the end of the nose forward and up, produced the expression which is sometimes seen with patients suffering from a severe alveolar abscess in this quarter. This being coupled with the fact that the lips closed with an effort, and when talking or laughing rose to an unpleasant exposure of the entire crowns and a portion of the gum above, the case presented one of the most unhappy dento-facial deformities it has ever been my fortune to correct. Compare this with the finished result—the entire removal of that protruded appearance, with nose corrected, graceful naso-labial lines (I wonder if Dr. Barnes ever saw a beauty of twenty-two with no naso-labial lines), lips that can now close with perfect ease and pose, and with normal mobility in action. It seems to me that anyone with a little artistic sensibility can plainly understand the truth of all this while viewing the pictures of the profile models, even though unable to fully appreciate the real conditions.

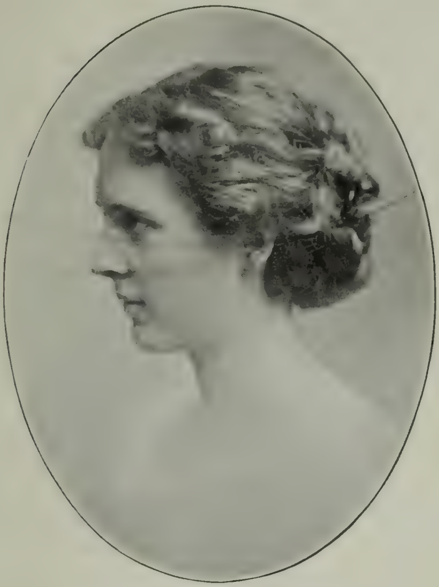
For the benefit of Dr. Barnes and his sympathizers I have procured the photograph of this young lady, taken some time after treatment, from which Fig. 21 is reproduced.

It must be remembered that the main object in this case was to correct the facial deformity and leave the patient with a good masticating occlusion. Though the cusps of the second bicuspids in the final cast are not in perfect mesiodistal interdigitation, the cusps were ground to give good antagonizing surfaces, while the lower second bicuspids antagonized perfectly in the sulci of the upper molars, and the mesial movement of the second molars brought the molar occlusion to nearly normal relations.

Now let us see what Dr. Barnes would have accomplished by his so-called modern methods of non-extraction and reciprocal disto-mesial movement of the upper and lower teeth.

We will assume for the sake of argument that he would have jumped the cusps of the bicuspids as he says, and placed the occluding surfaces of the remaining molar teeth in normal disto-mesial occlusion and sustained the new position with the lower artificial molars. Would he have accomplished this by a partial or even appreciable distal movement of the upper buccal teeth? No!—not for patients twenty-two years of age, with full and crowded arches, before the eruption and consequently before the possibility of extracting the third molars. And even then, had it been possible, it would only have been a tipping movement which would have increased the already lingual inclination of the labial teeth. If anything, it would have enhanced the already protruded effect of the incisor roots. Then how would he have accomplished his correction? Only by a protruding movement of the lower bicuspids and labial teeth the full width of a bicuspid. In order to do this it would have been necessary to also protrude the crowns of the upper incisors—the cutting edges of which touched at points the labial faces of the lower incisors at near their gingival borders.

FIG. 21.

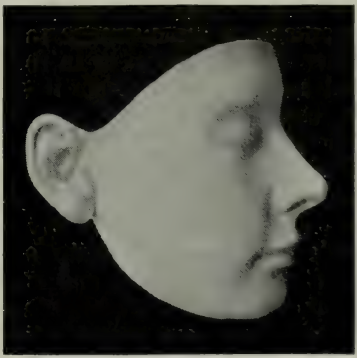


If there be any orthodontist so lacking in the common, everyday requirements of judgment as to be unable to see what effect upon the facial outlines such treatment would produce, I would advise him to turn his attention to other departments of dentistry.

It is needless for me to say that it would have increased the already protruded deformity of the upper, and by protruding the lower would have obliterated the much-desired labio-mental curve to the lower lip, with a probable receding chin effect, which is frequently seen with decided bimaxillary protrusions—a condition which the above movement would have surely produced. By still further straining the labial tissues over the protruded framework, the lips would be deprived of the proper redundancy for mobility of action and possibilities of perfect closure. All for what? To satisfy an absurd sentiment, that God does not make the same mistake (if one wishes to express it that way!) in the number and natural positions of human teeth, as He does repeatedly in other osseous portions of the facial framework; and therefore, as the theory runs, by shifting the crowns of the teeth to normal occlusion, it will be found "That the full complement of the teeth is necessary to establish the most pleasing harmony of facial lines."

I wonder if the time will ever come when men of good common sense in other things will as fully appreciate the fact as it is true that the natural malpositions of the teeth in phalanx, in relation to dento-facial harmony, are quite as fre-

FIG. 22.



quent as malpositions of other bones which characterize features of the physiognomy in relation to facial harmony, and that this malposition of the teeth is not merely that of the crowns, but that it more often than otherwise pertains to the roots as well, and to the alveolar process in which the roots are imbedded—in fact, to the whole dental portion of the jaws, which seems to be shaped in conformity to the general malposition of the teeth.

As the second case, shown by Fig. 20, was exactly the same type of dento-facial irregularity as the former, all that has been said in regard to that case applies equally to this; except what related to the loss of the lower molars and the final result in occlusion, which in the latter case appears to have more nearly retained the original masticating interdigitation of buccal cusps. It should be remembered, also, that this case as shown was not finished when presented.

Fig. 22 was made from the final plaster cast of the face after the case was finished.

SYMBIOSIS, WITH PARTICULAR REFERENCE TO THE BACTERIA OF THE ALIMENTARY CANAL.

By W. D. MILLER, D.D.S., M.D., Ph.D., Sc.D., Berlin, Ger.

(Read before a special joint meeting of the New York Odontological Society and the First District Dental Society of the State of New York, October 23, 1905.)

BY "Symbiosis" (from σὺν, *together,* and βιοῦν, *to live)* we understand a living together, or consortism—which may be either temporary or permanent—between animals or plants of different species, or between animals and plants.

According as this relationship results in advantage or disadvantage to one or the other of the parties, or in their mutual advantage, we designate it as parasitism, commensalism, and true or mutualistic symbiosis.*

When one of the parties concerned in a symbiosis lives upon and at the expense of the other without making any return, we designate the relationship as parasitism (from παρὰ, *beside,* and σίτειν, *to feed*), and the members of it as parasite and host. Numerous examples of parasitism in which the human body serves the part of the host are familiar to all, in the case of such parasites as fleas, lice, bugs, mosquitos, or, among the higher forms of parasites, tapeworms, trichinæ, etc.

Parasitism is exceedingly common in nature, more than one-half of all animals living a parasitic life.

The most important parasitism, as far as the human body is concerned, is that in which bacteria perform the part of the parasite; it being now well known that a large number of different kinds of bacteria are capable of living upon and at the expense of the human body—at the same time, by means of poisons which they produce, giving rise to by far the larger proportion of the diseases to which human flesh is heir.

Where the relationship is such that one plant or animal lives from the superabundance of the other, from the crumbs that fall from its table, so to speak, it is designated as commensalism (*con,* together, *mensa,* table). This relationship is less common and is of a harmless nature. We have an example of it in the sparrows which frequent the cabstands in the streets and feed from the grain that falls from the feeding-troughs of the horses; or in the case of those animals, particularly foxes, that follow the trail of the pekan or "fisher" (Pennant's marten). This animal often kills much larger game than it is able to devour, and the remains furnish a hearty meal for the commensalist, the only injury done to the pekan being an injury to its feelings, since, according to Long, it bitterly grudges a meal to the foxes and only gives up its booty when overcome by the desire for sleep consequent upon an over-hearty meal.

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* The term symbiosis is used by many authors to denote only those cases of relationship in which a distinct advantage accrues to each of the parties concerned.

We have also numerous commensalists among the bacteria which are found upon the surface of the human or animal body, living upon dead material in the form of dirt, epithelium, secretions of the skin, etc., without manifesting any pathogenic action.

Finally, when the association results in some distinct advantage to both of the parties concerned we have a true or mutualistic symbiosis. Of this many cases have been recently brought to light, some of which are apparently exceedingly wonderful and interesting in their nature. One of the best-known examples of true symbiosis is to be found in the relationship between the hermit-crab and sea-anemone. This crustacean, which for the purpose of protecting its soft body takes refuge in the deserted shell of some mollusk (periwinkle, whelk) is frequently observed to be carrying about one or more sea-anemones attached to its shell. It has furthermore been noticed that when the sea-anemone is removed from the shell of the crab and placed at some distance the crustacean is evidently disconcerted thereby, and hunts about until he finds his partner again, when he seizes it with his claw and replaces it upon the back of his shell.

It is evident that this relationship results in a decided advantage to the sea-anemone, inasmuch as it, being carried from one place to the other, comes into contact with fresh food, to say nothing of the fact that it partakes of the food collected by the crab.

Why the crab should be so desirous of having the sea-rose on his shell, and what advantage he could derive from it remained a riddle until an observation was made in the aquarium at Naples which seems to furnish a perfect solution of the problem. A devilfish was seen to approach the hermit-crab and insert one of its arms into the shell for the purpose of dragging out the inmate, whereupon the sea-rose shot forth a number of tentacles upon the arm of the devilfish, which, stung by the nematocysts with which the tentacles of the sea-rose are armed, withdrew in haste and desisted from its murderous attempt.

A species of crab has recently been described which goes about with a sea-anemone in each claw as a protection against the attacks of the devilfish.

Numerous cases of symbiosis no less interesting than the above will be found in works on natural history and related subjects (von Kerner, "Pflanzenleben"; Weismann, "Descendenz-theorie," etc.) such as that of the pea-crab, which inhabits the mantle cavity of certain marine mollusks, particularly of the pinna tribe, hence the name *Pinnotheres* (Pinna-guard). It is said to keep a sharp lookout and to advise its more sluggish companion of the presence of food by a delicate pinch, as well as to warn him of danger—perhaps by two pinches! As a reward for its watchfulness it is allowed to share in the food. "Thus fed by mutual aid the friendly pair Divide the gain and all the plunder share."

Another case frequently cited is that of ants and certain plant-lice (aphidæ). The ants protect the lice against the attack of insects, and receive in return a certain sweet excretion of the lice termed honeydew, which they cause them to give out by stroking them with their antennæ—a process which is designated as milking. The ants even take these lice with them into their nests and care for them pretty much as the farmer does for his milch cows.

Many cases, likewise, of true symbiosis between different plants are well known and have frequently been referred to by biologists, the most common being that between algæ and fungi, giving rise to the compound organism termed lichen. In this association the alga is said to furnish the carbohydrates and the fungus the water and mineral constituents necessary for the life of the organism. Likewise the rootlets of many trees (beech, oak, silver poplar, as well as many plants of moor and woodland) are surrounded by a dense network composed of the mycelium of certain fungi. This mycelium collects the moisture for the tree, possibly also furnishes it with other constituents which it cannot of itself assimilate from the soil, and receives in return nourishment from the tree.

The most extensive of all symbioses and the one which plays the most important rôle in the household of nature is a kind of triangular or tripartite symbiosis, existing between the animal kingdom, the vegetable kingdom, and those lower forms of plant life designated as bacteria. The animal, not being able to derive its nourishment from the soil, is absolutely dependent either directly or indirectly upon the vegetable kingdom for its nourishment. The vegetable kingdom, which exists upon simple inorganic substances, such as carbonic acid, water, and simple inorganic compounds of nitrogen, is dependent upon bacteria for the constant renewal of these substances, which without their aid would long since have been exhausted. The bacteria decompose dead animal or vegetable matter, and convert it back into these substances from which it was built up, and which are absolutely necessary for the continued existence of higher vegetation. In short, the animal kingdom is nourished by the vegetable kingdom, the vegetable kingdom in an essential manner by bacteria, and the bacteria by both the animal and the vegetable kingdom; accordingly, the necessary conditions for the existence of both the animal and vegetable kingdoms are brought about by the agency of bacteria.

Aside from this process, which is going on everywhere on the surface of the earth where vegetation exists, and in which nearly all existing kinds of bacteria may take part, it has been discovered that groups of bacteria working together are not only able to produce ammonia by a decomposition of organic matter, and to transform this ammonia into nitrite, and nitrite again into nitrate, making the nitrogen available for plant growth, but that certain bacteria of the soil, designated as nitrogen-fixing bacteria, have the power of taking up *free* nitrogen from the air—a faculty heretofore not observed in connection with any form of plant life, and certainly not possessed by any of the higher plants. These bacteria are found diffused throughout the rootlets of different vegetables, especially legumes, or in the form of nodules upon the rootlets. It is possible, if not probable, that various kinds of bacteria possess this property, though up to the present time only one (*Bacillus radicicola*) has been obtained in pure culture. Extensive experiments carried on in different parts of the United States have shown that when seeds are inoculated with this bacterium before sowing, a yield may be obtained which is two to five times as large as that obtained from non-inoculated seeds, and there is great reason to hope that large tracts of land which have been completely exhausted of their nitrogen by careless farming may by these means be restored to their original fertility.

The all-important rôle which bacteria have thus been shown to play in the household of nature has led to the supposition that the immense numbers of them found in the alimentary canal exist in a true symbiotic relation to the human body, and that they not only aid in the process of nutrition, but are absolutely essential to it.

The claim has been urged—

(1) That bacteria, being vegetable, serve as food for the organism in whose alimentary canal they are found.

(2) That they not only aid in but are absolutely essential to the chemical process of digestion.

(3) That they serve to keep processes of fermentation and putrefaction under control and to restrict them within proper limits.

(4) That the more or less irritating products resulting from their action upon foodstuffs are required to excite the peristaltic action of the intestines.

It seems to me, however, that the first claim can hardly be seriously entertained. They are produced in by far the greater part in the alimentary canal itself, and if it were true that they may be utilized as food they could hardly give back to us any more than they take from us. As a matter of fact, we know that they pass off not only undigested but not even devitalized, one-third of the excreta consisting of living bacteria alone. (Metchnikoff.)

The second claim rests upon a much more solid foundation, and it is to a careful consideration of this phase of the question that I wish to invite your attention.

We know that our foodstuffs must undergo certain changes in the alimentary tract in order to prepare them for the process of absorption and assimilation; starches must be converted into sugar, the proteids into peptone, fats must be emulsified, etc. These changes are brought about by ferments (ptyalin, pepsin, trypsin, pancreatin, etc.) which are found in the saliva, the gastric juice, the pancreatic juice, etc.

Now, we know that there are immense numbers of bacteria constantly present in the human mouth, and far greater numbers still—estimated on an average at 180,000,000,000,000—in the intestines (Strassburger), and that these bacteria possess in different degrees the same properties as the physiological ferments above mentioned. The conclusion appears, therefore, perfectly natural that the bacteria of the alimentary canal, while they live at the expense of their host, more than compensate for the food which they consume by the part they take in carrying on the process of digestion.

This supposition, to which Pasteur first gave expression (*Comptes rendus de l'Académie de Médecine,* vol. c, 1885, p. 66), was placed upon an experimental basis by the experiments of Professor Schottelius at Freiburg. Schottelius (*Archiv für Hygiene,* 1898, Bd. xxxiv, p. 210, and 1902, Bd. xlii, p. 48) sterilized hen's eggs by immersing them in a solution of corrosive sublimate which was afterward thoroughly removed by treating with alcohol; hatched out the eggs in a sterilized incubator, and fed the chicks on sterilized food. They ate voraciously, but did not grow in proportion; on the other hand, they gradually dwindled away and died in the third or fourth week after hatching. If, however, at any time during the experiment a small quantity of hen's dung was added to the food, by which the normal bacterial flora of the alimentary canal of the hen was introduced into the alimentary canal of the chicks, a change was immediately brought about, and from that moment the chicks revived and developed in a perfectly normal manner.

This question appears to me to be one of great general importance, and of especial importance to the dentist.

We have been teaching that bacteria are not only the cause of decay of the teeth, but of a large number of diseases and disturbances resulting therefrom, as well as the cause of many diseases of the mouth and throat and neighboring parts originating independently of the teeth, and that it is our duty to keep down the number of bacteria in the mouth as far as possible. We are now told that this is all wrong, that the human mouth is and should be the recruiting place for the bacteria of the alimentary canal, that they are necessary for the process of digestion, and that we should avoid the use of antiseptics as well as of other means which may inhibit or disturb the process of incubation in the mouth. The experiments of Schottelius appear to have been carried out in a most careful manner, and it is difficult to find any source of error in them, so that we are forced to conclude that as far as chicks are concerned bacteria do perform the rôle which has been attributed to them. It is by no means sure, however, that this result can be generalized. Mme. Metchnikoff experimenting on tadpoles found but a slight difference to the advantage of those fed normally over those which were fed with material free from bacteria, and we know that there are certain animals (scorpions, larvæ of moths, and other insects) whose alimentary canals contain no bacteria, but which nevertheless make use of substances as food that are very difficult to digest.

Finally, Thierfelder and Nuttal (*Zeitschrift für physiolog. Chemie,* 1895, p. 109) experimenting on guinea-pigs aseptically taken from the mother and fed on sterilized food, found that they developed in an almost normal manner, despite the fact that animals as well as babes prematurely born are backward in growth and strength as compared with those born normally. At the end of thirteen days the animals were killed, and the alimentary canal was found as a matter of fact to be free from bacteria. Unfortunately the strain of being obliged to care for the animals during the hours of the night rendered it impossible for the experimenters to carry out this experiment for a greater length of time.

Levin's statement that the alimentary canal of polar bears contains no bacteria seems to me to depend upon an error of observation. It is difficult to understand how these animals could have existed for ages without having once come into contact with any food containing bacteria, which having once obtained access to the body of one bear only, would naturally not have been influenced by the cold without, and would then have been communicated from one animal to another until they all became inoculated untold ages ago. There is nothing in the alimentary canal itself or in its juices which prevents the growth of bacteria, and the feces of the polar bears in zoölogical gardens contain bacteria in abundance.

There are, however, considerations apart from the above observation which render it difficult to accept the proposition that bacteria are necessary agents in the chemistry of food digestion.

In the first place the ferments in the different juices of the alimentary canal are, as is well known, able to carry on the process of digestion without the assistance of bacteria.

As for the diastatic action of bacteria in the mouth, it must be considered insignificant as compared with that of the ptyalin, since we know that the latter acts immediately upon the starch, whereas the bacteria of the mouth, as far as they have been studied with reference to this point, act but slowly and feebly.

Again, there is but a slight possibility that bacteria can in any way aid the process of digestion in the stomach. Not only does the acidity of the contents of the stomach inhibit the development and action of bacteria, but we know that when for any reason (whether it be because we have taken more food than the stomach is able to care for, or that there is a mechanical or chemical insufficiency of the stomach) an excessive development of bacteria and correspondingly intense processes of fermentation *do* take place in the stomach, digestion is not only not aided thereby, but serious disturbances result which manifest themselves not only in catarrh or inflammation of the mucous membrane of the stomach, but in general symptoms, such as nausea, headache, vomiting, etc. The aid of bacteria in gastric digestion is synonymous with a "deranged stomach."

We must accordingly restrict ourselves to the intestines in the search for any confirmation of the supposition with which we are dealing.

The possibility of bacteria acting as aids to intestinal digestion rests with the decision of the question whether they do or do not convert considerable portions of the proteid substances of the food into peptones, and while we must of course acknowledge that many bacteria of the alimentary canal may possess the power of peptonizing albumin, yet it appears that the "most important bacteria of the intestines as a rule do not attack proteid substances, and in particular do not peptonize them." (Schmidt und Strassburger.) Furthermore we must not forget that bacteria themselves require peptone, and we have no proof for the supposition that they create peptones in any considerable quantity above that which they require themselves, and when we take into consideration the fact that one-third of the feces consists of bacteria we must acknowledge that great quantities of peptone are necessary for supporting so prolific a vegetation. On the other hand, we are not even in a position to prove that the bacteria of the intestines, instead of converting albumin into peptone, do not take the shorter and more convenient route and make use of the peptone produced by the normal physiological process of digestion. This would be in full accordance with the principle that functions and even organs which have become useless tend in the course of time to disappear, and as the tapeworms *(Cestoda)*, which—living in or upon media containing food already digested and prepared for assimilation—have lost the power of carrying on the process of digestion and are not even provided with digestive organs, so it becomes a question whether bacteria which have grown for generations in a medium rich in peptone do not lose in part at least the power of peptonizing albumins.

Bacillus radicicola offers some very suggestive facts in this connection. This organism was first cultivated by Nobbe and put upon the market under the name of "nitragin." Experiments made in inoculating seeds with this material did not lead to satisfactory results, so that the preparation was withdrawn from the market. When the matter was taken up by the Bureau of Agriculture at Washington, they succeeded in producing cultures which accomplished the desired results and by means of which wonderfully prolific growths of alfalfa, clover, wheat, etc., could be obtained. This marked difference in the action of different cultures of the same organism has been accounted for by the fact that the culture media made use of by Nobbe were rich in nitrates, and the bacillus, not being required to draw upon the air for its supply of nitrogen, lost in a great measure the power to do so.

Again, it is very well known that the process of digestion as carried on by bacteria outside of the alimentary canal not only results in the peptonization of albuminous substances, but also in the production of substances which render the foodstuffs undergoing such digestion unfit for food, if not absolutely dangerous. Bacterial digestion gives us the rotten egg, the decaying vegetable, the spoiled meat, fish, oyster, etc., which are not only unfit for food, but in some cases violently poisonous.

This suggestion is also corroborated by experience, for it is perfectly well known that when an overgrowth of bacteria takes place in the alimentary canal and the normal process of digestion is replaced by bacterial digestion, not only severe local disturbances but general intoxications in more or less pronounced degree are the result.

Finally we must not lose sight of the important fact emphasized by various authors, that digestion takes place in the small intestine, and virtually ceases when the large intestines are reached. This is just the opposite of what should be expected if the bacteria were there to assist in the process of digestion—since we find comparatively few in the small and myriads in the large intestines; and Metchnikoff, after pointing out the various disturbances which result from absorption of poisonous products of bacterial action in the large intestines, comes to the conclusion that this part of the alimentary canal is not only not necessary for digestion, but on the other hand is a constant menace to health and even life. He cites the case of a woman in whom a fistula had led to a total atrophy of the large intestines. She lived, notwithstanding, over thirty years in this condition, becoming the mother of three children, whom she was able to support by the work of her hands. Metchnikoff suggests the possibility that the skill of the surgeon through further development may reach so perfect a stage as to make it possible to remove the large intestines as a prophylactic measure and thus avoid the many dangers to which they give rise.

In regard to the activity of bacteria in the mouth—which naturally interests us in particular—we have seen that there is little reason for attributing to them any rôle of importance in the process of converting starchy substances into sugar, whereas on the other hand it has been perfectly well established that they are the cause of all those various processes of fermentation, particularly of carbohydrates, which result in the final destruction of the teeth. It is true that attempts have been made recently to attribute the formation of acid in the human mouth to other causes. At the meeting of the Fourth International Dental Congress in St. Louis, Hinkins of Chicago (DENTAL COSMOS, March 1905) advanced the idea that the ptyalin of the saliva not only converts starchy substances into sugar, but goes still farther and transforms sugar into acid, thereby leading to the destruction of our cement fillings and to the production of caries. I have dealt with this question in the DENTAL COSMOS for November 1905, and have reached the conclusion that the results of the experiments carried on by Hinkins are not sufficient to establish the point which he claims (see DENTAL COSMOS).

Again, Lohmann of Cassel maintains that there can be no fermentation in the mouth because the food remains too short a time to be acted upon by the ptyalin, and that, anyway, starch is not converted into dextrin but into maltose by the action of ptyalin, and that maltose and other representatives of the cane-sugar group are not fermentable. I have also shown the absolute untenableness of this view of Lohmann in the article referred to, and will only say in this connection that the bacterial origin of processes of fermentation in the human mouth has been established beyond any question, and that it is highly desirable that persons advocating contrary views should not bring them before the profession until they have thoroughly worked them out and are able to furnish reasonable proof of their correctness.

In view of the many reasons presented above, I think we are justified in having serious doubts respecting the utility of bacteria in the alimentary canal as aids to digestion. On the other hand it is universally admitted that the overgrowth of bacteria everywhere interferes with the normal and healthy process of digestion, and invariably leads to more or less serious disorders, and that as far as the care of the mouth is concerned the more thoroughly we can prevent the growth of bacteria the more we shall be able to limit the ravages of decay and the more shall we be able to eliminate various local and general diseases for which the human mouth furnishes a point of entry. A healthy mouth is a most potent factor in bringing about and maintaining a healthy condition of the body; a diseased mouth, containing myriads of bacteria, is a constant source of danger to its possessor.

The question presents quite a different aspect in case of animals whose food (grass, hay, straw, etc.) consists largely of cellulose, and I think that Schmidt and Strassburger ("Faeces des Menschen," 2d ed., p. 299) are probably not far from right when they say "The life of higher animals in which the breaking up of cellulose and the consequent utilization of the food in the process of digestion performs the chief rôle, cannot be maintained for a great length of time without the aid of bacteria."

This fact hardly comes into consideration in the case of human beings, whose chief foods contain but a small percentage of cellulose:

Rice	0.2	per cent.
Rye meal	1.8	" "
Wheat	2.9	" "
Potato	3.1	" "
Beans	4.1	" "
Peas	6.4	" "

—percentage of the dry substance.

To the cellulose of our food is consigned the very important function of keeping up the peristaltic action by means of the mechanical irritation exercised upon the walls of the intestines by such material, and it is a question whether its solution by bacteria would not be a positive injury, inasmuch as it is known that the absence of this irritation results in chronic obstipation.

Notwithstanding the above facts and conclusions, it is (3) quite possible—if indeed it may not be considered as an established fact—that there are certain kinds of bacteria in the alimentary canal which may be looked upon as benefactors, not because of any direct symbiotic relation to the human body, but because of their antagonism to other and harmful bacteria.

It has been pretty well established that in all of the cavities of the human body communicating with the external world there are certain bacteria which appear soon after birth and which may be considered as the specific flora of those cavities. They apparently perform a beneficent rôle in virtue of their antagonism to other bacteria, by inhibiting or at least limiting the growth of extraneous bacteria, both pathogenic and non-pathogenic, which from time to time obtain access to the cavities in which they have become established.

I have discussed this problem under Question VII, page 91 of the DENTAL COSMOS for February 1903, and will consequently refer the reader to the article in question without repeating the considerations there presented, except to say that in all probability a very important rôle is performed in the human mouth by certain bacteria which prevent the pathogenic micro-organisms which are constantly obtaining access to the oral cavity from obtaining a foothold, or at least have the tendency to modify their growth and attenuate their virulence to such an extent that the danger incurred by their presence is reduced to a minimum. In the alimentary canal it is chiefly the B. coli and B. lactis aerogenes (acid-producers) which by bringing about an acid fermentation of the carbohydrate constituents of the food give rise to the production of lactic acid, which has the effect of inhibiting or restricting the growth of the putrefactive bacteria, and thereby prevent the intense processes of putrefaction which always give rise to serious disturbances. The acid reaction is, however, not the only factor to be taken into consideration in this connection. Quite as important is the antagonism in the struggle for existence which may exist between different kinds of bacteria and which apparently does exist between B. coli, etc., and the putrefactive bacteria of the intestines.

It is an interesting fact that one of the bacteria to which this function has been attributed (B. coli) is itself pathogenic, and becomes an element of great danger to the human body whenever it escapes from its strict confinement within the walls of the alimentary tract.

Thus we have in the intestines two hostile groups of bacteria antagonizing each other, each one being present presumably for the purpose of keeping the other within proper bounds. The intestines themselves are a sort of neutral fighting-ground, and are very frequently made to suffer from the depredations carried on by one or the other of the two hostile parties. The advantages accruing to us are very problematic, particularly as we must feed both armies free of cost and are in constant danger of being wounded by stray shots.

In still another way (4) the bacteria of the intestines are supposed to exert a very important action, as is claimed; that is, by the production of volatile fatty acids, gases, etc., which have the effect of exciting the necessary peristaltic action. When the development of bacteria and the corresponding products of decomposition are deficient the intestinal peristalsis becomes feeble and constipation results. We have seen above that the peristaltic action is kept up also by the mechanical action of undigestible woody fibers (cellulose) of our vegetable foodstuffs.

We have, finally, to deal not only with the possibility of antagonism, but it has also been equally well established that we meet with symbiosis between different kinds of bacteria, and bacteriologists have discovered that different kinds will grow together on culture media where one or the other of them alone shows no development. Kohlbrugge isolated two different bacteria from the soil which, together, peptonize albumin, while either of them alone is completely devoid of this power. I have also found that one kind of bacterium seldom or never produced more than 0.75 per cent. of lactic acid in solutions of bouillon with sugar, whereas the same bouillon infected directly from the mouth, and consequently containing different kinds of bacteria, will take on a much higher degree of acidity; and in mixtures of saliva with foodstuffs I have frequently observed a degree of acidity corresponding to two per cent. of lactic acid. Frohmann likewise found that two species of bacteria isolated from carious dentin associated together produced a much more intense fermentation than either alone.

It is consequently an exceedingly complicated problem with which we have to deal in the attempt to solve the question of the absolute or relative immunity of certain persons to caries of the teeth, as well as to other diseases of the mouth. We have not only to deal with the chemical and physical properties of the food, with the structure, shape, and relative position of the teeth, with the condition of the gums, the amount of saliva and its chemical and physical properties, with the number and different kinds of bacteria present, but also with the possibility of antagonisms and symbioses between different kinds of bacteria in the mouth; and when we remember that it is more than a life-work to make a study of all of the different kinds of bacteria met with in the human mouth, we then appreciate the vast amount of work which will be necessary to investigate the action of these different bacteria with respect to the total sum of all their activities resulting from antagonism and symbiosis when associated as they are in the mouth.

In my earliest communication on the subject of the bacteria of the mouth and of processes brought about by them, I insisted upon the necessity of experimenting under conditions resembling as nearly as possible those which are present in the human mouth. Other authors, even in more recent publications, have shown an inclination to attach undue importance to pure cultures alone, and to criticize my work in this connection. It now appears that my standpoint was the correct one, and had it been adhered to by other investigators in this field we probably should be farther advanced in our study of the bacterio-pathology of the human mouth than we are. As long as we confine our investigations to a study of the action of bacteria in pure cultures only, we shall never be able to acquire a thorough understanding of the manifold and complicated processes which are going on in the human mouth.

An equally important and difficult problem is that of the relative immunity of the soft tissues of the mouth to infection. It is a fact of common knowledge that these are much less liable to infection than the other tissues of the human body, and that such a wound as that produced by the extraction of a tooth if made under the same conditions in any other part of the body would almost invariably lead to severe infection, whereas in the mouth such a result is fortunately the exception.

I have shown that this fact is not to be attributed to any protecting antiseptic power manifested by the saliva, and the only explanation which we have been able to find for it rests upon the positive chemiotactic properties of the saliva, as the result of which myriads of leucocytes accumulate in the wound made by extraction, for example, and take up a large number of bacteria which obtain access to the wound, thereby contributing in a large degree to the process of purification; and, except we take into account the mechanical resistance offered by the dense structure of the gum tissue and by the epithelial covering of the mucous membrane in general, no other factor has been found up to the present which helps to furnish an explanation of the phenomenon in question. In our future work in this line we must also take into account the antagonism which undoubtedly exists between different kinds of bacteria in the mouth, and which may lead to so marked a diminution of the virulence of pathogenic bacteria—if it does not even restrict or inhibit their growth—as to render them comparatively harmless.

THE RATIONAL TREATMENT OF PUTRESCENT PULPS AND THEIR SEQUELÆ.

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(Read before the First District Dental Society of the State of New York, at its thirty-seventh anniversary meeting, December 12, 1905.)

IT was my pleasure in May of this year to present a paper before the Dental Society of the State of New York in which I discussed, so far as I was able, the chemistry involved in the decomposition of the pulp tissue. At that time I emphasized the phase of this process relating to the discoloration problem. It is my intention tonight to discuss more intimately the treatment of this condition and its sequelæ.

In the practice of medicine today there is a tendency to place the treatment of all disease conditions on a rational basis. Empirical methods of treatment are being rapidly relegated to the past. Nearly all the leading universities, whether they sustain medical departments or not, have well-equipped laboratories, and engage scientific investigators who devote their entire time to experimenting with drugs and remedies upon the lower animals, thus developing the field of pharmacology —a science which treats of the action of drugs and remedies upon the tissues, organs, and functions of the body. The development of this science demands from medical men, therefore, the practice of mono- rather than polypharmacy. The modern physician today diagnoses his case, and prescribes drugs and remedies because he knows which ones are indicated, and why. He no longer prescribes a miscellaneous combination of drugs the action of many of which he does not understand, thinking and hoping that perchance one may effect a cure. This, in brief, is modern medicine.

What are we doing in dentistry to develop dental medicine, and to place the treatment of all diseased dental conditions upon a rational basis? Generally speaking, we are proud of the progress dentistry has made. Our pride is such that many in our ranks are not contented to be classed as specialists in medicine, but claim, and perhaps justly so, that we belong to a true and distinct profession. We are amazed at the rapid strides made in porcelain art and many other phases of dentistry; but can we really be proud of the progress made in dental therapeutics? When I read the various dental journals, and find that our literature contains so little on scientific and practical therapeutics, and so much on subjects of far less importance, valuable though they be, I feel that in our anxiety to develop certain branches of our calling, this branch has not received the attention which it merits. This was not true, to the same extent at least, in the earlier history of our profession; for by the efforts of some of these earlier practitioners to develop this all-important branch, anesthesia was given to the world.

If there is one condition more than another which in the past has been treated by purely empirical methods, I believe it to be that of putrescent pulps and their sequelæ. The reason for this can be found in the apparent lack of interest which the profession generally has shown in the chemistry of pulp-decomposition. A knowledge of the changes wrought in the splitting up of the complex bodies of the dental pulp by micro-organisms is of vital interest to every practicing dentist; and yet how contented we have been, seemingly at least, to go on in the same old way, making no effort to familiarize ourselves with this important subject.

In most instances drugs have been selected and used solely because of their ability to inhibit the growth or destroy the vitality of micro-organisms, absolutely ignoring the fact that there were other things, such as irritating gases and poisonous ptomains, found in the canal and tubular structure of the dentin, and ignoring also the further fact that it was as necessary to dispose of these substances as it was to destroy germ life. Few realized that the only method by which drugs and remedies could be scientifically applied to the treatment of these conditions was to have a definite knowledge of the intermediate and end-products resulting from the putrefactive process.

In order that you may follow me and understand the method of treatment which has been so successful in my hands, and which, in a general way, I have previously given to the profession, it will be necessary for me to ask your indulgence while I review briefly the chemistry herein involved.

So far as the chemical elements constituting living tissue are concerned, the pulp tissue differs very little if any from other animal tissue. I have made this statement before, and in one instance at least it has been interpreted that I have been "unable to discover that the pulp tissue differs in any way from animal tissue elsewhere." In all of my writings upon this subject I have recognized that the pulp tissue differs structurally and histologically from most other animal tissue; but I repeat that I have been unable to discover any difference so far as the chemistry of the tissues is concerned, all of the elements being present which are necessary for the formation of proteids, carbohydrates, and fats, and it is my opinion that these three classes of compounds are present as such in the original pulp tissue.

These elements may be, and probably are, arranged differently in the various compounds, but this does not change the general line of reasoning on which the chemistry of pulp-decomposition is to be elucidated, and only from a knowledge of which can rational methods of correcting these conditions be inaugurated. It will be unnecessary for me in this paper to enter into a detailed discussion of the chemical facts which led up to the method of treatment which shall be outlined later. I shall only ask you to remember, therefore, that the chief constituent of all living tissue is the proteid bodies, and that it is largely the intermediate and end-products resulting from the putrefaction of this class of compounds which, if forced through the apices of the roots, are capable of producing pathological disturbances, as I shall now attempt to explain.

Whenever the dental pulp dies from any cause, and is invaded by pathogenic micro-organisms, one of the first changes brought about in the dead tissue is the splitting up of the complex carbohydrate and proteid constituents into simpler and well-known compounds. By this I mean to say that, conditions being favorable, the germs first act upon the complex and unstable substances, splitting them up into less complex compounds, many of which, however, are capable of further analysis, and the process goes on until the decomposition is complete. From the fermentation of carbohydrates result such compounds as water (H_2O), carbon dioxid (CO_2), and acetic acid ($HC_2H_3O_2$). The putrefaction of proteids produces hydrogen sulfid (H_2S), and ordinarily such ptomains as putrescin ($C_4H_{12}N_2$), cadaverin and neuridin ($C_5H_{14}N_2$). These ptomains resemble in many respects the vegetable alkaloids, and by some authorities are classed as animal alkaloids. In selecting drugs to correct this condition we should remember that all of these ptomains contain nitrogen—that peculiar, undecided, and indifferent element; that two of them, putrescin and cadaverin, are highly poisonous, capable of producing inflammation and suppuration; and that they all can be further putrefied, evolving ammonia (NH_3).

From our sad past experience we knew that some kind of mephitic gases were evolved in this process of pulp-decomposition which, if confined, would produce severe pathological disturbances.

But just what the gases were, and how the unfavorable conditions were brought about, we were left to conjecture. Now we know, or I believe we do, that the main gases produced are ammonia and hydrogen sulfid. We know, too, that when these gases cannot readily escape through a cavity, pressure is produced, thereby forcing the poisonous ptomains through the apices of the roots into the surrounding tissue, causing septic pericementitis and in many cases an alveolar abscess.

TREATMENT.

This much of the chemistry of this complicated process being known, we can with some hope of success select drugs which are truly indicated in the treatment of these conditions; and I come now to the discussion of remedies with some satisfaction.

To my mind there has been a needless discussion about the penetrating or non-penetrating power of coagulating agents in putrescent root-canals, for those of you who are familiar with the dental literature of the past know that some of the leading men of our profession have objected to the use of phenol, creasote, solutions of zinc chlorid, etc., in the treatment of these cases, because they are "powerful coagulators of albumin." These drugs are here contra-indicated, it is true, but not because they possess this property; for when the dental pulp is undergoing or has undergone the process of decomposition, the proteid constituents or coagulable substances have lost their former identity, and new compounds with entirely different properties have been formed.

In selecting drugs to be used in the treatment of these conditions I have therefore eliminated the question of coagulation, and have selected drugs which I know, if properly used, will unite chemically with the intermediate and end-products of decomposition, converting them into odorless and non-infectious compounds, as well as destroy germ life. In this connection we should remember that the putrescent condition has been brought about through the agency of micro-organisms by a gradual analytical process; and as stated above, among the products formed which must be considered in the treatment are hydrogen sulfid, the poisonous ptomains (putrescin and cadaverin) and ammonia or derivatives, the latter gas being evolved from the further putrefaction of the last-named compounds. It is well to remember also that fats are a class of end-products resulting from the putrefaction of proteid substances.

The main gases formed, then, are ammonia and hydrogen sulfid. Now, it will be necessary to dispose of these gases in order to hermetically seal the cavity —an object much to be desired; for by so doing we prevent the oral fluids from contaminating the medicine within the tooth, the medicine from escaping into the patient's mouth, and the tooth from changing color during the time of treatment. It has been known for some time that formaldehyd (CH_2O), a gas which occurs in commerce in a thirty-seven per cent. aqueous solution, and which solution is recognized by the United States Pharmacopeia of 1900 under the name of liquor formaldehydi, or formalin, will unite with ammonia, producing urotropin, a solid, as—

$$6CH_2O + 4NH_3 = (CH_2)_6N_4 + 6H_2O.$$

I believe, from a reaction which I have worked out, that formaldehyd unites with hydrogen sulfid, forming methyl alcohol, a liquid, and sulfur, a solid, as—

$$2CH_2O + 2H_2S = 2CH_3OH + S_2.$$

It is stated on good authority, too, that this same gas, formaldehyd, unites with basic ptomains, forming inodorous compounds. By the use of formaldehyd, then, we can change the irritating gases and poisonous liquids (largely ptomains) into non-irritating and non-poisonous liquids and solids. The official solution of formaldehyd, however, is too strong for general use; therefore, inasmuch as fats result from pulp-decomposition and are present as such in a putrescent root-canal, I selected tricresol (now also recognized by the U. S. Pharmacopeia of 1900 as "cresol") as the vehicle with which to dilute formalin. This agent was selected for three principal reasons: (1) It is miscible with formalin in all proportions, thus making a good pharmacal product. (2) It is a good disinfectant, much more powerful than phenol. (3) It acts chemically upon the fatty compounds, thereby disposing to advantage of these substances.

I shall now direct your attention to the details of a method by which I believe these conditions can be treated with the least inconvenience to our patients and to ourselves, and in making this statement I wish it understood that I do not belong to that class of practitioners who are ever on the alert for something easy regardless of results; yet I am always ready and anxious to grasp any method by which the comfort of my patients can be conserved and their interest not neglected. This is the plain duty of every dentist, and is one of the reasons why gold and porcelain inlays are receiving the favorable recognition today which their value merits. The tendency of this age is toward simplicity in all things.

We will now consider the treatment of putrescent pulps. Our first duty here, as in all treatment cases, is to make a correct diagnosis, after which the rubber dam should be adjusted in every case where it is possible to do so, and all the teeth included sterilized. For this purpose I use either a ten per cent. solution of formaldehyd to which a small amount of borax has been added, or a 1:500 solution of mercury bichlorid in cinnamon water. After using one of these solutions the teeth are bathed in alcohol, when, with a large round bur, the pulp-chamber is freely opened, exposing all of the canals, but making no attempt to remove the contents therein. Now on a small pledget of cotton the following remedy is placed in the pulp-chamber and over the mouth of each canal:

Original formula.

℞—Cresol,
Formalini, āā f℥j. M.
Sig.—Use as directed.

It is always best to seal the cavity with a quick-setting cement, for the remedy should be hermetically sealed and pressure must be avoided. This dressing can remain until you desire to have the patient return for a subsequent sitting. I prefer to leave it about two or three days. However, it can be changed safely the following day, and no harm follow if it remains a week or more. At the second sitting the dressing can be removed and the canals mechanically cleaned, when a 1:500 solution of mercury bichlorid in hydrogen dioxid—suggested to me by Dr. M. L. Rhein of New York—is gently worked down into each canal, after which the canals should be dehydrated with alcohol and warm air, and the modified formula placed on cotton in each canal, and the cavity again hermetically sealed:

Modified formula.

℞—Cresol, f℥ij;
Formalini, f℥j. M.
Sig.—Use where indicated.

It is well to allow this dressing to remain for at least three days, by which time the remedy will have sterilized the entire tubular structure of the dentin, thus establishing asepsis. All that is necessary now to prevent recurring sepsis is to thoroughly fill the canals.

In the treatment of those cases where the patient did not present until the confined gases had been forced through the end of the root, carrying the poisonous ptomains into the surrounding tissue, it is our duty to try and aid nature in aborting an abscess. It is in these cases that good judgment must be exercised, and extreme care taken. There is no condition which we are called upon to treat wherein a practical knowledge of pathology and therapeutics will serve us better than in this particular case. Frequently patients delay coming to the dentist until the infection has progressed to a point where all remedies will fail in aborting an abscess; but in many instances this result may be prevented by the proper use of drugs. After hermetically sealing our remedy in the tooth containing the putrescent pulp, as outlined above, our attention should be given to the treatment of the infected alveolocemental membrane. In order to control the infection, and at the same time aid nature in readjusting the abnormal condition, it is not only our privilege, but our duty in these severe cases to administer internal drugs. Here alterative drugs are indicated. The great representative of the alterative class is potassium iodid, which can be given in the following prescription:

℞—Potassii iodidi, ʒjss;
Syrupi sarsaparillæ
comp., f℥iij. M.
Sig.—Take a teaspoonful in water after meals.

The general directions should be to have the patient take a teaspoonful three times a day after meals, but in these cases of septic pericementitis or incipient abscess it is best to direct the patient to take a teaspoonful every two hours until three or four doses are taken, and then follow the directions written on the label. It is well also to avoid the accumulation of blood in the part. To prevent this, saline cathartics are indicated—one that can be given is the official solution of magnesium citrate, a prescription for which follows:

℞—Liquoris magnesii citratis, f℥xij.
Sig.—Take one-half at once, and the remainder in two hours if necessary.

I do not give the remedies here mentioned in all cases of incipient abscesses, as the local treatment will suffice in most instances. No therapeutist can tell exactly what internal drugs he would suggest without seeing the case and knowing the history; for there are many circumstances and conditions which modify the effect of drugs, one of these conditions being the climate.

In malarial regions and in the spring of the year, in the locality in which I practice, the salts of quinin can be given with beneficial results. The salt which I prefer in the cases under consideration is quinin bisulfate. Nearly all pharmacies have the salts of quinin put up in the form of pills. While these pills may be given, it is much better to write a prescription for capsules. The gelatin capsule is soon dissolved in the stomach; thus we obtain the action of the drug more rapidly than when given in the dry, hard, pilular form. The following prescription can be written for the drug in two-grain doses:

℞—Quininæ bisulphatis, gr. xxiv.
Ft. capsulæ no. xij.
Sig.—Take one capsule every hour until the effect becomes noticeable.

Quinin acts differently upon different individuals. Most adult patients know the effect of this drug upon their system, and therefore will be able to aid the dentist in determining the amount to be taken.

One of the most prominent symptoms with which we have to contend here is pain. In most cases the pain will soon subside after the remedy has been hermetically sealed within the tooth; however, it is necessary occasionally to administer drugs which act upon the central nervous system, thereby controlling the pain. There are several drugs which, if properly given, will produce the desired effect. I have had much satisfaction in the use of acetanilid. The U. S. Pharmacopeïa of 1900 recognizes a compound powder of this drug which can be prescribed:

℞—Pulveris acetanilidi comp., gr. xij,
Ft. chartulæ no. ij.
Sig.—Take one powder at once and the other in two hours if not relieved.

CHRONIC ALVEOLAR ABSCESS.

I shall now direct your attention to the treatment of chronic alveolar abscesses. There are two varieties of alveolar abscess—those without an external opening, except perhaps through the cavity in the offending tooth, and those which are discharging through a fistula or sinus. In these cases the decomposition of the pulp tissue is complete; the intermediate products (ptomains and amido-acids) have largely been broken up, and pus has been formed from the tissue surrounding the end of the roots.

In treating that variety of abscess which is without an external opening, our method is somewhat different. The tooth should be located, the rubber dam adjusted, and the teeth sterilized as before; then the pulp-chamber is opened with a suitable round bur. Usually the pus flows freely, in which event it is permitted to do so, pressure being made on the tissue immediately over the end of the root. It should be our effort to mechanically evacuate as much pus at each sitting as is possible. This being done, we have no necessity for using formaldehyd in the same strength solution as in those cases where the pulp-chamber, root-canals, and tubuli are filled with the intermediate and end-products. The modified formula will be useful here. The canals should be dried with alcohol as thoroughly as possible, and the remedy on cotton hermetically sealed in each canal. It is, however, impossible at this sitting to get the canals dry, and it is unnecessary to have them so, for the remedy will penetrate where moisture is present. This is an advantage over most remedies suggested for this purpose.

In those cases where there is a copious flow of pus at the first sitting, the original formula can be used, and the dressing should be changed every day until it can be removed without the pus flowing from the canals. When pus is forming rapidly at the ends of the roots the dressing soon becomes dissipated, the remedy is neutralized, and it is a loss of time to leave it in the canals more than twenty-four hours. Unless there be some complication, the pus formation should be checked in one or two treatments; at which time the modified formula can again be used. It is now possible to change the dressing too often. The formation of pus has been checked, and the tooth should not be disturbed for at least one week or ten days, in order to give nature a chance to effect a cure. If at the end of this time there is no evidence of pus and the case gives a favorable history, the canals can be filled. Should there, however, be a slight odor although the tooth has not caused any trouble, we are not justified in filling the root. In these cases we can further modify our original formula by taking one drop of the mixture and adding two or three drops of cresol. It should be remembered that the value of formaldehyd in any remedy to be used in the treatment of these conditions depends upon the power this agent has of uniting chemically with the hydrogen sulfid, ammonia, and the poisonous ptomains. When these substances are not present, formaldehyd, especially in this strength solution, is contra-indicated.

I mention this here because I know this remedy is being used for nearly all conditions. It should not be. It is strange how some practitioners expect to find one drug or remedy which can be used in every case all through their practice.

Quite frequently in these abscess cases, after the formation of pus has been checked we have a weeping of serum from the canals. An excellent remedy to use in this case is eucalyptol to which thymol has been added in the following proportion:

℞—Eucalpytol, f℥j;
Thymol, gr. x. M.
Sig.—Use as directed.

If this remedy fails to check the secretion, and the fluid is serum, not pus, no hesitancy need be felt as to filling the root, although the canals cannot be dried.

Occasionally we find a chronic abscess of this variety where it is almost impossible to check the formation of pus by applying drugs to the canals of the teeth. In those cases where the pus continues to flow freely when the dressing is removed at the third or fourth sitting, some complication can be expected. It is necessary then to force some stimulating agent through the apices of the roots, after the pus has been mechanically evacuated. The stimulating agent which I use almost invariably is a fifty per cent. solution of phenol-sulfonic acid. This preparation is made by heating phenol in an evaporating dish, adding the sulfuric acid, and then the water slowly while hot. If the resulting solution is not clear, it should be filtered by packing cotton in the neck of a funnel and passing the solution through. In resorting to this means of bringing about a more acute condition, I desire to emphasize the necessity of first evacuating the pus as completely as possible before using the remedy, after which the agent should be gently forced through the apices, and the modified formula, or even cresol alone, sealed in the canal. It will be found that one or two treatments will usually check the formation of pus, after which the case can be treated as an ordinary abscess of this kind. In case this method fails to effect a cure, however, it will be necessary to surgically establish an opening through the overlying process and soft tissue, and treat as for an ordinary discharging abscess—which treatment we will now consider.

In those cases where the pus is discharging into the mouth through a fistula, our first duty is to locate the offending tooth. This is generally a simple matter, for the reason that the sinus usually opens immediately over the tooth from which it comes. The pus in making its exit, however, follows the line of least resistance, and in some cases the condition of the process is such that the pus burrows forward or backward, and opens through the gum at a point several teeth removed from the one which is causing the trouble. These are the cases that are difficult to diagnose, especially where the abscess has been discharging for some time, when there is not much tenderness in any special tooth, and where there are several devitalized teeth on this particular side of the mouth. Sometimes two teeth containing putrescent pulps have a common fistula. In this case it would be impossible to heal the tract by treating only one of the teeth. The use of a silver probe will be valuable in all such cases. By gently working the probe forward or backward, the sinus can be explored and the offending tooth or teeth located without drilling into innocent teeth—a discouraging procedure to both patient and dentist. The tooth being located, all that is necessary to effect a cure—there being no complication—is to force some bland solution through the root-canal and fistula, thus being certain it is well established; cauterize the tract, hermetically seal in the canal or canals the same agent used for this latter purpose, and at the subsequent sitting fill the root.

The general method of applying drugs to the treatment of these conditions is so well known that I refer to it but briefly. There are two objects in forcing a bland solution through the fistula: one is to be certain that it is open, and the other is to mechanically wash out the pus. Whenever pus can be mechanically removed, it is always better to dispose of it by this means rather than attempt to do so by the use of some chemical agent. It is common practice, I believe, after the fistula is thus established, to use a solution of hydrogen dioxid. This is often a dangerous procedure, and always unnecessary if the first solution has been used in sufficient quantity. For cauterizing the fistulous tract I use phenol, unless the abscess is of long standing, when I can reasonably suspect a roughening of the end of the root or process through which the pus has been discharging; in these cases I use pure phenol-sulfonic acid. This agent rapidly disintegrates cotton, therefore it should be applied to the canals on shreds of asbestos or silk, when with unvulcanized rubber and a suitable instrument it can be forced through the fistulous tract, cauterizing the same, and also chemically dissolving any sharp edges of root or process, which may be a source of irritation and prevent healing. I do not believe in delaying the root-filling long after the fistula has been cauterized; for by filling the root as soon as we are certain that the fistula is healing, we avoid a weeping condition which usually exists, and which is annoying when this part of the treatment is delayed for one month or six weeks as advocated by some writers.

While the permanent filling of the root and the bleaching of the tooth, if necessary, constitute a part of the treatment of these conditions, I have already consumed so much time that this phase of the subject will not be discussed. I must take occasion here, however, before closing, to answer briefly a few queries which Dr. Kirk of Philadelphia, in the November COSMOS, has asked editorially in his review of the paper which I read before the Dental Society of the State of New York in May of this year.

RATIONALISM OF THE METHOD.

The only point which Dr. Kirk has raised bearing any relation to the subject under consideration tonight, is this: "We are constrained to inquire into the rationalism of preceding the bleaching operation with sodium dioxid by a treatment with a mixture of formaldehyd and tricresol. What desirable therapeutic end can be attained by the formol-tricresol combination that cannot also be attained as well by the sodium dioxid? Why use both when the latter must be used under the circumstances anyhow, and is sufficiently antiseptic and germicidal to effect complete sterilization? Why first destroy the germ and its waste products with a cannon and then destroy them some more with a Gatling gun?" The answer to these questions is plain to anyone who has used both methods for treating putrescent pulps. There are many cases where the pulp is undergoing the process of decomposition in which the tooth, as yet, has not been discolored. All such cases can be treated by the method which I have outlined tonight, without the tooth changing color. As I endeavored to make clear in the article in question, I use sodium dioxid in those cases where the tooth was discolored before the patient presents for treatment; and then only after the tooth has been treated and the canals filled, for it is not used with the end in view of establishing asepsis—this has been accomplished by other and better means—but for the sole purpose of restoring the natural color to the crown of the tooth which is to be saved by filling. I was forced to abandon the use of sodium dioxid for treating putrescent pulps; for, in my hands, the method was impracticable.

I am not only willing, but anxious to have the rationalism of the method which I have just outlined in detail questioned by those who have given it a fair trial and have found it wanting; but it is unfair to myself and manifestly unjust to the profession for a man with the professional standing of Dr. Kirk to question the rationalism of the method without having tried it; and it is evident that he has never used it, or his clinical experience would have forcibly answered the questions which he so thoughtlessly propounds to me.

In considering this subject tonight I have gone into details to an extent which, perhaps, may have been tiresome. This was done because the remedy which I suggested for the treatment of putrescent pulps and abscesses without an external opening is being used where it is contraindicated. I know that the remedy has been sealed in teeth from which live pulps have been removed, and used also in other places where it should not be. It is a valuable remedy if confined to the canals of the teeth and used where indicated, but it is a most dangerous one if used carelessly or where contra-indicated. For this reason I have discussed details tonight. I do not refer to this in any apologetic spirit; for I remember that "whatever is worth doing at all is worth doing well," and that the great men of the world are not those who despise "small things," but rather those who improve them the most carefully. One day Michael Angelo was explaining to a visitor at his studio what he had been doing since his previous visit: "I have retouched this part—polished that—softened this feature—brought out that muscle—given some expression to this lip, and more energy to that limb." "But," said the visitor, "these are trifles." "It may be so," replied the sculptor, "but you must recollect that trifles make perfection, and perfection is no trifle."

The method which I have outlined tonight may not be perfect in every detail. I do not claim that it is the only one by which good results can be accomplished; but I do claim that it is practical, and is along rational lines, which cannot be said of all methods suggested for the treatment of these conditions.

A CRITICISM OF THE DISCUSSION UPON AN ESSAY ENTITLED "IS THERE AN IDEAL OCCLUSION IN THE HUMAN JAWS?"

By WM. BEBB, D.D.S., Los Angeles, Cal.

(Read before the Los Angeles Association of Dental Alumni.)

IN the January 1906 issue of the COSMOS there appeared an article entitled "Is There an Ideal Occlusion of the Teeth in the Human Jaws?" by Dr. Herbert Locke Wheeler of New York, and in the February number followed the discussion which it brought forth.

During the past few years, in reading the various essays and discussions which have appeared in our dental literature I have been impressed in many instances with the lack of scientific reasoning presented, and I therefore desire from this standpoint to consider a few of the questions which more particularly relate to orthodontia in this discussion and those which have appeared elsewhere in our recent journals.

While in an article of this nature it is possible to enter into but the most meager discussion of biology, nevertheless I trust I may be pardoned for presenting a little of the elementary phase of one branch of this science, to serve as an introduction to some of the subjects which we will consider later.

The theory of heredity, with the tendency of offspring to resemble parents, is so well known to everyone that we need not here discuss it. But the subject of variations is one which we do not so readily comprehend; in fact, trained biologists are the only ones who recognize the great extent of variations which affect all organisms and all parts of every organism.

A single illustration taken from Metcalf's "Organic Evolution" will suffice to convey some idea of the truth of this statement. Take so simple an illustration as a seed-pod and seeds. Metcalf says: "The number of seeds is variable, as also is the proportion of them that will mature. The size, shape, and weight of seeds vary, while within the seed is a variable amount of nutriment, and careful chemical analysis would show that this nutriment is not absolutely constant in character. The relative proportions of the parts within the seed are by no means constant, for in some seeds the embryo will be relatively larger and the nutrient material fill smaller space, while in other seeds these relations will be reversed. In the minute embryo which each seed contains the relative proportions between the several parts, the miniature stem, leaf, and bud, are subject to much variation. Examine still more closely and you will find that in the cells of which any portion of this minute embryo is composed there is no uniformity in shape, size, or structure."

If these are facts, and we admit that variations occur, is it to be supposed in relation to human anatomy, especially that of the teeth and surrounding parts with which we are most concerned, that there are no variations except those which come under the heading of "mutation" or "freaks"?

Keeping these points in mind, we will consider some of the statements which appeared in the discussion referred to.

One speaker says: "Are you going to admit that God made a mistake and put too many teeth in a person's mouth? The essayist hints at that, only he says "nature." It is the old idea that a child may inherit the small jaw of one parent and the large teeth of the other parent. If you had a baby born with one foot longer than the other, would you attribute it to the fact that the mother was shorter than the father? Did you ever see such a thing, unless the child was club-footed?"

Another says: "Dr. Wheeler is inclined to believe that large teeth can be inherited from one parent which are out of proportion to the physiognomy inherited from the other parent. He would therefore in some instances extract teeth to harmonize conditions. This theory has never borne analysis, and never will. It is difficult to understand why inheritance is blamed so eternally for conditions which are so plainly the result of factors operating after birth. If the laws of inheritance operate so disastrously to mankind we might expect the weirdest specimens of freaks to eventually inhabit the earth. Men with legs, or feet, or arms, or ears of unequal size—and heaven knows what the internal organs would be like! It is just as rational to apply this theory of unequal inheritance to one part of the anatomy as to the other."

The first statement is somewhat ambiguous, for one might infer that a child born with a club-foot was the result of the fact that the mother was shorter than the father.

Considering the question in the broader sense, as was doubtless intended, it is true we cannot say that the feet of the child are of unequal size because one parent was shorter than the other; on the other hand, can we prove that it is not true.

We can, however, positively say that the offspring may have feet of unequal size, nay, nearly always do.

We all know that in adult life few individuals are possessed of two feet alike in all proportions, but in many countries where various coverings are employed the influences operating after birth would tend to produce differences. However, among certain races where no artifical foot-protection is used we should doubtless find many feet of unequal shapes and sizes.

Referring to the second quotation, one who was conversant with the laws of heredity would know that, in the animal kingdom, "freaks," beings of "mutation" (a better term offered by Dr. Vries) are born, but that owing to the process of natural selection they do not often survive and perpetuate their kind. For instance, how long would a rabbit born with a club-foot escape from an enemy so fleet as a fox? In the human family are to be found many more evidences of mutation than exist in the lower orders, for by our superior intelligence we protect the weak and deformed and thus often permit them to produce offspring, while in the lower animals these succumb to the attacks of enemies, or die from starvation.

As regards the internal organs, I am sure that no one on earth can say whether so large an artery as the right subclavian, for example, will be given off from the arteria innominata or the arch of the aorta. And who can say what strange variations may be found in the lesser structure?

Our text-books upon anatomy were written after many dissections had been made and the average taken as a guide, but when a surgeon enters the abdominal region, for instance, he cannot be positive that he will there find the structures always constant and just as they appear in the text-book.

Again, it is said, "We do not see a child with one blue eye and one brown," but I think we can all recall instances of such a condition. This would properly come under the heading of "mutation." However, between these extremes of coloring we have a percentage including all the gradations down to two eyes of one shade. Does anyone doubt these statements, he can confirm them by consulting one whose business it is to manufacture and fit artificial eyes. And should he desire to further investigate the question he will doubtless find that one-third of all eyes are unequally distant from the bridge of the nose and fifty per cent. vary in refraction, although in some of these cases agencies operating after birth may have wrought differences.

Again I quote: "If the gentlemen who are interested in the question of type and the relation between facial contours and dental irregularities will arrange a meeting at which photographs of profiles can be thrown on a screen and the casts of those cases—good casts—brought, I will venture to produce a committee from the American Society of Orthodontists that will look at the faces on the screen without seeing the casts and tell you the nature of the irregularities."

It would be interesting to see this experiment put to the test. I doubt very much that one could prove the assertion. If we examine the photographs of the completed cases exhibited by the orthodontists, in many instances we will be unable to determine that they are more regular or beautiful than an equal number of those whose teeth would be classed as somewhat irregular. If the successful cases show nothing upon which to base conclusions, what might we expect from the failures, or those cases where the teeth were placed in "normal occlusion" and never exhibited because they were failures?

Are we not laying ourselves open to criticism in this particular by claiming that certain faces of classic beauty—Savanarola for instance—show certain conditions when by no possible means can we produce evidence to substantiate these claims.

A word about types.

This word *type* has been juggled and tossed about as if it were to be no more seriously considered than a conjurer's ball. We hear men talking about the Roman type—the Greek—the Greco-Roman, and others.

While in a general way we recognize certain types of questionable scientific application, yet in order to attempt a discussion of what constitutes a human type with the attending effort to apply the same, it becomes necessary to familiarize one's self with the writings of the philologists who attempt to classify races according to their languages, and the ethnologists who base their conclusions upon physical characteristics. After one has done this he will understand how well-nigh hopeless is the task of deciding what constitutes the type of the Armenian, Greek, German, Celtic, or what not. And to still further attempt to trace these peoples through all their wanderings over the continent of Europe and the islands, following them to this country, and to account for all the intricacies of intermarriages, etc., would be the merest folly.

Nor can we be reconciled to the use of the early artists' conceptions of type. Not only because we are dealing with a physical being which is subject to variations, but because the varied conceptions of early art cannot be accepted as a scientific guide.

Dr. Ottolengui has said nothing about types, but I would like to ask whether in considering his collection of insects he found, for example, a specimen new to him, without having seen the type from which the insect had been described and named, and without having a knowledge of the description, he could refer the same to its correct genus and species, and enumerate the particulars wherein it normally agreed or disagreed with the type specimen?

Again it is said: "Why is it that only in the mouth nature makes these mistakes? and why is it that it is the teeth that are always too large and the jaw too small? They never get mamma's teeth in papa's jaw; it is always the other way around."

Regarding the above statement, we know that the orthondontists of a few years ago were largely responsible for this oft-repeated and unscientific expression. Without sanctioning these terms—my opinion of which later explanations will show—it is only necessary for me to refer you to so careful and scientific an observer as Dr. Cryer of Philadelphia, who in substance says that this conclusion gained credence because it referred to the only condition which presented itself to the orthodontist for treatment, while many cases were to be found presenting the opposite condition—"small teeth in large jaws."

There are few who believe that literally a child inherits the large teeth of one parent and the small jaws of the other, or *vice versa.* This is an unscientific and meaningless statement which should once and for all be relegated to the background, but I think we are nearly all agreed that the child does inherit the combined characters of both parents with variations, and recognizing the causes which operate after birth to produce irregularities, we may still entertain a reasonable doubt that as yet the orthodontists have offered a very definite proof that heredity does not play an important part in the confusion of the dental organs.

It is difficult to accept a proposition which at best has borne the test of but a few years, to demonstrate truths which are opposed to the teachings of biological science. We know that some animals vary more or less than others; for instance, the domestic goose breeds so true that the birds of today are not unlike their early ancestors; on the other hand witness the innumerable varieties of descendants of the wild jungle-fowl. Likewise we know that one part of an organism may vary more than another, and it seems to me that the most rational theory which we can apply to the solution of the cause of the irregularities of the teeth and their environment, aside from the recognized external causes, is that the enamel organ which dictates the shape of that portion of the teeth which appears above the gum line, being of epiblastic origin, is prone to vary in a greater or less degree than their bony support, which is derived from another and entirely different layer of cells.

One gentleman says: "If it be true that a child can inherit the large teeth of one parent and the small jaws of the other as frequently as supposed, then I ask you why do we not find the same condition in the deciduous teeth? The fact is, heredity has very little to do with malocclusion at all."

He then offers the following theory for the cause of irregularities: "What does take place is in my judgment this: The offspring has teeth unlike either parent, but a blending of both, and if there were no interruption of development in the life of the organism up to maturity, there would be no malocclusion. But owing to the fact that the crowns of the teeth assume their full size long before the normal time for their eruption, and so many causes come in to retard development of the surrounding tissues, there is very frequently—in fact almost always—some malocclusion."

The latter portion of this statement is doubtless true, but if this theory be applicable it seems to me it would operate upon the deciduous teeth as well as the permanent. Do the agencies which come in to retard the development of the surrounding tissues become operative only when the permanent teeth appear? Does a child have adenoids, and breathe through the mouth, only after the permanent teeth have erupted?

I have long puzzled my head over the question of the greater irregularity of the permanent than the deciduous teeth, without arriving at any satisfactory conclusion.

If I hold to any one opinion more than to another it is this—only in adult life do the variations of any organism become apparent to their fullest extent. The nearer we approach to the first stages in the development of an animal, the less apparent to outward appearance become the variations. For instance, at a certain period in the life of the human fetus the resemblance to many of the lower animals is very marked, and the differences between the lateral halves of the body are hardly discernible.

At the birth of a child, to the casual observer the features are uniform and regular, thus accounting for the beauty of babyhood and youth.

Consider an illustration from a brood of white Leghorn chickens in which the strain was not quite pure. At the time of hatching, all the chicks would be apparently of about equal size, the color and character of the down and the shape of the head and beak would to all appearance be not unlike, and the sexual characteristics would be obscure. However, when these chicks had grown to maturity some of them would be larger than others, while certain ones might have scattering feathers of black or gray; the tall combs and long tail-feathers of the males would differentiate the sexes, thus exemplifying how variations become apparent to their fullest extent *only* when the organism reaches adult life. Is it not probable that the deciduous teeth seem more in accordance with their supporting framework because of this fact, or because the greater variation has not as yet become apparent?

The use of the expression which appears in this discussion and often elsewhere, that "Nature's plan is to harmonize, in the case of the jaws as well as every other part of the organism," is meaningless unless it further comprehends the laws of natural selection. It is true that nature does tend to harmonize one organ with another, and the various organisms with their environment, but this is accomplished largely through the slow process of natural selection.

Man, in a short space of time as compared with the countless ages reckoned in evolution, can produce abnormalities which would require many, many years to effect restoration to harmonious conditions, if it could ever be accomplished. Witness the dental armature of our bulldog. How great a part has man's ingenuity played in producing these inharmonious relations, and how little has nature been able to combat it!

In this discussion Dr. Young says: "The question of heredity seems almost like a joke, for if we give this question serious consideration the absurdity of it will soon be apparent to all; but, strange to say, this is the principal cause of malocclusion in the minds of those who have not given the question serious thought and study."

It is puzzling to know just what idea Dr. Young intended to convey by the foregoing statement, but if I believed that he was really serious in making such an absurd statement I would be inclined to severe criticism, for if the question of heredity in its application to the human body, to the teeth and their supporting framework, seems like a joke, then the very foundations upon which the science of biology rests are a joke and are tottering; then all the labors, investigations, and teachings of such men as Hertwig, Flemming, Darwin, Huxley, and Wallace become ridiculous, and it behooves us to discard them and substitute something more rational.

Now a word about extraction for the correction of irregularities. I believe that in most instances extraction is contra-indicated, not because the teeth and their bony support can in all cases be placed in a perfectly harmonious relation with the physiognomy, but because I am inclined to believe there is not in many instances so great a variation as to warrant the extraction of a bicuspid five to eight millimeters in diameter, or a molar nine to twelve millimeters between contact points. Does not herein lie the secret of success of the operations of the modern orthodontist? Furthermore, it seems to me that the classification and method proposed by Dr. Angle for the correction of irregularities is the most rational working hypothesis that has ever been presented to the dental profession, and I doubt if it can be improved upon. That in the largest percentage of cases it will render wonderful improvement to the facial contour has already been demonstrated, to say nothing of the unquestioned benefit of the improved occlusion; but we are not unreasonable if we doubt that this or any other classification can ever suffice to differentiate between a normal and abnormal relation of the teeth and the physiognomy.

In conclusion I desire to say that I am not an orthodontist, but that I bow in humble admiration to the marvelous skill of these professional men. All honor to those who by patient study and persevering effort have accomplished results for suffering humanity which rank with the most wonderful achievements of modern surgery!

I honor my chosen profession and those men who are making it noble, and if I appear in some instances to harshly criticize, it is only for lack of better phraseology. I admire the man who, right or wrong, dares to express an honest opinion; only I would urge that we strive for higher scientific attainment and expression, that we may the better emulate the sentiment of those beautiful words of Thomas Huxley: "The longer I live, the more obvious it is to me that the most sacred act of a man's life is to say, 'I believe such and such to be true.' "

PROCESS OF CONSTRUCTING A METAL DENTURE WITH SOLDERED TOOTH-ATTACHMENTS WITHOUT SUBJECTING THE TEETH TO THE FLAME.

By LANDIS H. WIRT, D.D.S., Indianapolis, Ind.

AFTER having swaged the base and articulated it as for an ordinary metal denture, select the teeth, using any of the detachable-pin crowns (Fig. 1), such as the S. S. W. or Davis crown, etc.; for the molars use the pinless vulcanite teeth.

FIG. 1.

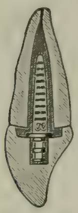
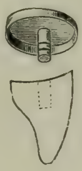
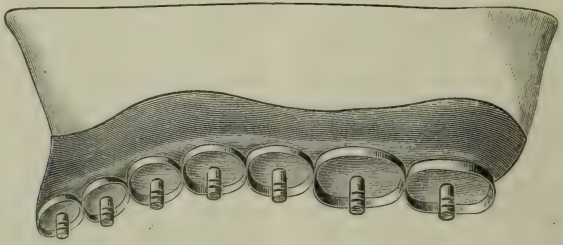


FIG. 2.



Swage for each tooth a base of thin gold, and solder a pin as shown in Fig. 2. Place these on the teeth, fastening them with a film of wax; then adjust the teeth with wax on the cast in the articulator, as they are to be in the completed case. Remove the teeth by warming slightly with a hot instrument, being careful not to disturb the arrangement of the bases. (Fig. 3.)

FIG. 3.



Next remove the plate from the cast in the articulator, and invest it in a mixture containing asbestos fiber, to prevent any change in the shape of the metallic base. Let the investment fill the palatal surface of the case, and leave ample thickness over the rims and pin bases. After it has set, remove by means of hot water the wax from between the ridge of the plate and the pin bases, after which flux and flow solder into this space.

When the soldering is finished, the buccal and labial surfaces may be veneered with pink rubber vulcanized thereon. When the whole is polished, the teeth may be secured in place with a good crown and bridge cement, in the same manner as they would be cemented to natural roots in the mouth.

This makes not only a substantial and artistic denture, but likewise gives a natural appearance to the lingual aspect of the plate which cannot be obtained with any other kind of teeth.

These crowns may be used on ordinary vulcanite cases by cutting a slight groove mesio-distally across their bases with a thin stone, thus allowing a little extra rubber to flow into the holes, which in the case of a metallic base are intended for the posts.

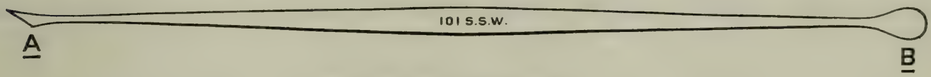
A METHOD FOR PRODUCING THE NATURAL CONTOUR OF ARTIFICIAL TEETH ON THE LINGUAL AND PALATAL SURFACES OF ARTIFICIAL DENTURES.

By **WILLIAM MIDDLETON FINE, D.D.S., Philadelphia, Pa.**

(Clinic given before the Pennsylvania State Dental Society, Philadelphia, June 29, 1905.)

FIRST, take a good plaster-of-Paris impression, and if a vacuum chamber is indicated it should be carved in the impression. The next step is to prepare the cast, and from that the wax bite; then the articulation, and finally the base-plate. The bite-plate will then be ready for trial in the mouth. The teeth are set up in the usual way in wax, the gums carved, and the whole denture made to reproduce the lost teeth and supporting tissues. The case is then tried in the mouth, and, if found to be perfectly satisfactory in every way, is then taken to the laboratory for finishing. A small specially designed spatula is used for carving the lingual and palatal surfaces, shaped like the instrument shown in Fig. 1. The end (A) is the one mostly used in carving; the opposite end (B) is used for removing the wax from between the teeth and in trimming the denture, the edge being very thin.

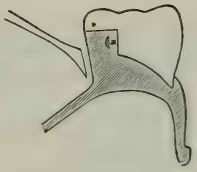
Fig. 1



Carving instrument.

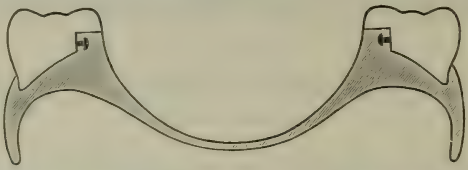
Hold the articulator in the left hand, and open it so that the upper denture will be in front of the operator and at the top; start at the last tooth on the left side and proceed to carve the wax, using the point (A) of the spatula; carve downward, using the palatal surface of the porcelain tooth as a guide, and shape the wax to represent the natural tooth as it stands in the natural gum. (Fig. 2.) After the palatal surface of the second molar has been carved, proceed to the first, and so on around the arch of the denture until the work is completed. Then prepare the rugæ. To do this, one must have several dies of either pure tin or zinc; but tin is better. Secure an impression of a mouth having well-defined rugæ, or better still, if the patient has such well-defined rugæ, take an impression thereof, and make a die. After obtaining the die, take a piece of tin foil, No. 40, and burnish it over the rugæ on the die, using the rounded end of a lead-pencil eraser to press the foil into contact with the die. A piece of tin foil should be used large enough to cover the entire palatal surface of the wax denture, and to extend one-quarter inch beyond the margin of the palatal surface. After the burnishing is completed, re-

Fig. 2



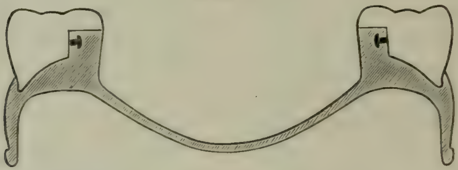
move the tin foil very carefully, and fill the depressions in the side next to the die with wax by melting it on a spatula and dropping it on the tin foil; then heat the spatula quite hot and iron it down smooth. By this means the surface that is brought into contact with the palatal surface of the wax denture will be perfectly smooth. After this phase of the work is completed, press the piece, wax side down, into the wax denture and finish around the teeth by burnishing very

FIG. 3.



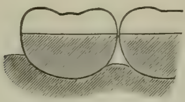
Vertical cross section of upper denture incorrectly finished.

FIG. 4



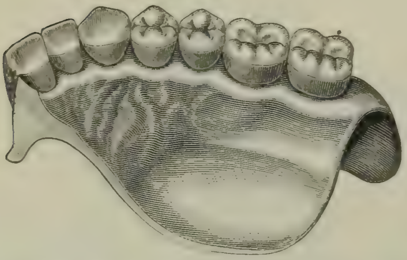
Vertical cross section of upper denture correctly finished.

FIG. 5.



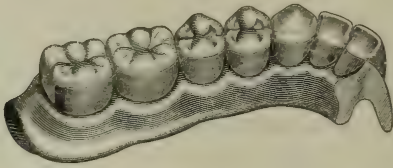
Manner of finishing palatal surfaces of molars and interproximal spaces.

FIG. 6.



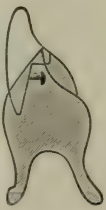
Upper vulcanite denture showing natural contour and rugæ correctly reproduced.

FIG. 7.



Lower vulcanite denture showing lingual contour correctly reproduced.

FIG. 8.



Cross section of lower vulcanite plate correctly finished.

carefully, but do not burnish the edges down flat. Allow them to stand up at right angles, so that when the case is flasked the free edges of the tin foil will be embedded in the plaster, and held in place. The result is a tin-foil covering to the palatal surface of the wax denture; then after the tin foil has been applied to the gums, to which it is burnished in the same way, the case is ready for flasking.

After the wax has been boiled out, cover the cast with very thin tin foil No. 4 or No. 6. Pack the case with rubber in the usual way, and vulcanize. The dentures are finished by scraping, sandpaper, pumice, chalk, rouge, etc., in the usual way.

CORRESPONDENCE.

"INTERSTITIAL GINGIVITIS."

To the Editor of the Dental Cosmos:

Sir,—In the April number of the Dental Cosmos appears an article by Dr. Herbert L. Wheeler of New York—"Some Observations upon the Obscure Etiology of Pycrrhea Alveolaris." Among other statements, at the top of page 475 appears the following: "Pyorrhea alveolaris is such a misleading term that I hesitate to use it, as it implies a pus condition which is by no means always present during the destructive process; and interstitial gingivitis is quite as misleading, as it implies an inflammation of the gingiva between the teeth which is not always present."

How the essayist could get the impression that interstitial gingivitis means or implies an "inflammation of the gingiva between the teeth" I do not comprehend. Certainly there was no intention on my part in suggesting it. *Gingivitis,* of course, is understood as an "inflammation of the gingivæ or gum margin." *Interstitial,* according to Billings, means "pertaining to connective tissue"; according to Foster, "disseminating through the substance of an organ or part; of an inflammation affecting the connective tissue of an organ"; according to the Century, "*interstitial growth* or *absorption* (as of bone), growth or absorption taking place throughout the substance of the organ, and not merely on its surface."

No mention has ever been made in any of my writings to lead one to infer that only tissues between teeth were involved. If the essayist were familiar with bone pathology he would certainly not have made the above statement. To show that he is not familiar with bone pathology, it is only necessary to quote his article in the second paragraph from the bottom of the same page: "Now, just what takes place in this destructive process I do not know, and I know of no one who has satisfactorily described it." Again, on same page he says: "It is apparent to one who has observed this condition carefully that what occurs in the progress of this disease is not primarily a receding of the gums, as is universally inferred from the language used in describing this condition, but the destruction in some way of the underlying alveolar plate of bone; and the settling down of the soft tissues as their support is withdrawn through the loss of bone underneath, causes the apparent recession."

If Dr. Wheeler will read the following articles—"Pathogeny of Osteomalacia, or Senile Atrophy" in the *Dental Digest* for August 1903; "Interstitial Gingivitis or So-called Pyorrhea Alveolaris," *Dental*

Summary for 1903; "Endarteritis Obliterans and Arterio-hypertrophy in the Alveolar Process," *Dental Digest* for October 1904, and my work on "Interstitial Gingivitis, or So-called Pyorrhea Alveolaris"—he would find that someone *has* "satisfactorily described it." The pathology of this disease has been well worked out. It would seem that the time had passed when dental writers should completely ignore the work of others, or criticize such work from the standpoint of ignorance.

EUGENE S. TALBOT.

CHICAGO.

PROCEEDINGS OF SOCIETIES.

NATIONAL DENTAL ASSOCIATION—NINTH ANNUAL MEETING.

(Continued from page 478.)

The Clinics.

PORCELAIN.

Dr. N. A. STANLEY, New Bedford, Mass. "An Easily Constructed Porcelain Crown for Molars." [This clinic has already been published, as given before the Massachusetts Dental Society: see COSMOS for February 1906, page 156.]

Dr. J. Q. BYRAM, Indianapolis, Ind. "Fusing Porcelain."

Dr. Byram gave a clinic on the fusing of porcelain, especially with reference to the results obtained by the use of the pyrometer furnace. He demonstrated the necessity of slowly fusing porcelain by showing the injurious effect of rapid fusing. Under-fused porcelain is granular and opaque in appearance, while over-fused porcelain presents a glass-like surface and is much lighter in color.

Dr. J. F. ROSS, Toronto, Ont. "Restoring Gum Tissue with Porcelain Gum Enamel."

Dr. Ross's clinic consisted of the insertion of a porcelain filling in the labio-gingival surface of a canine, restoring an area of receded gum tissue with porcelain gum enamel. The filling was prepared upon a platinum matrix with Close's body of a shade to match the color of the tooth, and Close's "gum enamel" was used to restore the gum line. The tooth body was first applied in its proper place in the matrix and after removing the excess of moisture, the gum enamel was applied, again removing the excess of moisture. The operator proceeded in this manner until the filling was completed.

Dr. G. T. BANZET, Chicago, Ill. "Porcelain Inlay."

Dr. Banzet's clinic consisted in the insertion of a porcelain inlay in an upper left lateral incisor; the restoration involved approximately one-third of the tooth mesio-distally, and extended about two millimeters below the gum margin.

Dr. F. W. LOW, Buffalo, N. Y. "Method of Building, with Jenkins' Prosthetic Porcelain, an All-porcelain Crown, Adaptable to the Root of Any Tooth, but Especially Available Where the Teeth are Broken Down to the Point that the Adjustment of a Band Becomes Painful and Difficult."

Procedure: (Step One.) Grind the tooth until the end of the root is well under the gum margin, so that the joint between the crown and the root will not be visible after the operation is completed and the tissues about the root have healed. Prepare the root-canal and cement into it a platinoid screw post of the largest size that the root will properly carry, cutting off the protruding end of the post to such a length as the bite will indicate, in order to provide space for a sufficient amount of body in that portion of the crown where the stress of mastication would be most apt to break it, bearing in mind that it is not essential that the end of the screw post should protrude to any great length.

(Step Two.) Out of any thin metal, such as platinoid or German silver, make a small cornucopia. Fill this to overflowing with "dentallac" and press it while warm over the end of the root while the post is in position, and thus obtain an accurate impression of the surface of the root to be crowned. (Fig. 1.)

FIG. 1.

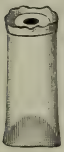


FIG. 2.

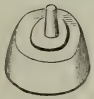


FIG. 3.

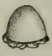
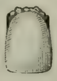


FIG. 4.



(Step Three.) Into the hole made by the platinoid pin in the dentallac impression, fit a short wooden or metal peg; mix cement as for a filling, model it around the end of the dentallac impression, and when the cement has hardened separate it, and a model representing the end of the tooth with the platinoid pin in it will be the result. (Fig. 2.)

(Step Four.) On to the cement model burnish a gold matrix. Remove the matrix and invest it in powdered asbestos. Dry out the investment and fuse upon it in the furnace a small conical button made of Jenkins' prosthetic porcelain. (Fig. 3.)

(Step Five.) Place this conical button on the root of the tooth in the patient's mouth and secure a small mush-bite in plaster; then from this impression make models of both jaws, and proceed to build up the crown upon this foundation button until the length, breadth, and bite accommodation are correct, using the plaster models as guide. (Fig. 4.)

(Step Six.) Fit the finished crown, made with the Jenkins prosthetic porcelain, in the mouth, and if found satisfactory both in color and shape, strip off the gold, etch, and cement permanently. (For this purpose I use Ames' special inlay cement.)

I have made between thirty and forty of these crowns, and the results so far have been satisfactory in all cases.

Dr. G. B. MITCHELL, Buffalo, N. Y. "A Rapid and Accurate Method of Porcelain Obturation without a Matrix."

Dr. E. B. SPAULDING, Detroit, Mich. "Reproducing the Entire Natural Enamel with Porcelain."

ORTHODONTIA.

Dr. A. L. MIDGLEY, Providence, R. I. "Fractures of the Jaw with Models and Appliances."

The treatment of fractures of the maxilla and mandible was demonstrated by means of models and appliances. Models of cases in practice showed the alignment of the teeth both before and after treatment.

Case I. Double fracture of the left maxilla in the bicuspid and molar region. On account of the marked displacement, and since the antrum was involved, the case was treated with a vulcanite interdental splint and skull cap.

Case II. Simple fracture of the mandible in the incisal region with little displacement. The aluminum splint used in treating this fracture was shown.

Case III. Simple fracture at the angle in an edentulous mouth. The upper and lower dentures of the patient were vulcanized together and used as any interdental vulcanite splint in conjunction with the skull cap. In this way the relation of the two jaws was not altered.

CROWN AND BRIDGE WORK.

Dr. D. O. M. LECRON, St. Louis, Mo. "Modern Crowns and Continuous Gum Work."

Dr. L. L. BOSWORTH, Cleveland, Ohio. "The Use of the Electric Current in Gold Soldering."

Dr. G. A. BOWERS, Nashua, N. H. "Original Method of Tipping Porcelain Teeth for Bridge Work."

The facing is beveled from the cutting edge toward the pins (Fig. 1) and backed with pure gold, 35 gage, allowing the gold to extend well out from under the facing. (Fig. 2.) The backing, after being thoroughly fitted either by hand or swaging, is removed from the facing. The reinforcement may be made by melting pure gold scraps, with a little platinum or clasp metal added for hardness. Cut a piece of metal of sufficient length to extend across the cutting end of the facing, the thickness of this supplementary piece being governed by the nature of the bite; with a pair of tweezers hold this extra piece in apposition with the cutting edge of the backing, and unite the two with a little solder. (Fig. 3.) Place the backing upon the facing and finish. Fig. 4 illustrates a reinforced backing for close-bite.

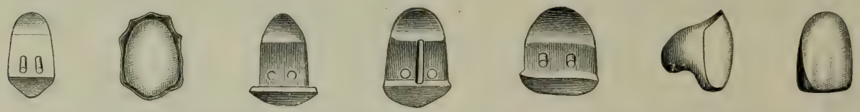


FIG. 1. FIG. 2. FIG. 3. FIG. 4. FIG. 5. FIG. 6. FIG. 7.

Fig. 1: Facing beveled ready for backing. Fig. 2: Facing with backing showing overlap. Fig. 3: Backing and tip ready for soldering. Fig. 4: Reinforced facing for close-bite without display of gold. Fig. 5: Soldered. Fig. 6: Finished bicuspid with reinforced backing. Fig. 7: Restoration of corner.

The posterior teeth are prepared in the same manner, being tipped and finished and incorporated into the bridge, the bite being restored by swaging the lingual or palatal half of the cusp in gold upon a die plate and waxing it to the finished tip. (Figs. 5 and 6.)

Corner restorations may be made by grinding away the facing and bringing the gold over it and the part to be restored. It is then removed and the supplementary piece added. (Fig. 7.)

This system has a wide range of applicability and the operation always results in a perfect-fitting tip.

Dr. W. A. Brownlee, Mount Forest, Ontario. "Crowning a Root Decayed Below the Gum Margin."

It was my purpose to show my method of crowning a root so decayed below the gum margin as to render impossible its restoration with a porcelain crown. When the root has been treated and tested for a length of time sufficient to assure the operator that it would be safe to complete the work, the apical foramen is sealed with very short gutta-percha points. Now, with a drill, the sides of which are parallel, straighten and enlarge the canal to about the size of No. 7 in Martin's screw plate, and with a small steel tap of that size cut a thread in the prepared canal.

For posts I prefer platinum, as it is tough and easily manipulated. Select a piece the required size and pass it through the screw plate, cutting a thread over its entire length. Dip the end in chloro-percha and screw it tightly into the canal already prepared, cutting it off an eighth of an inch below the margin of the gum. Proceed with each canal in the same manner. After the posts are all in place, fill the canals around their base with cement. Make a German-silver band the size of the root, place it in position over the posts, and retain it there by packing around it cotton saturated with Mills' cavity varnish. With a slow-setting amalgam pack the root around the screw-posts, filling the band also. Be careful to leave sufficient space between the amalgam and the occlusal surfaces of the opposing teeth to allow for the reinforced cusps on the shell crown. Dismiss the patient, and at a future sitting cut off the German-silver band and fit on a gold shell to suit the case.

The advantage I claim for this method is that the anchorage is not dependent on the weak part of the root, but is deep down in the canal, so that fracture of the root is next to impossible.

If the operator should desire to use a porcelain facing, allowance can be made for it while preparing the German-silver band and during the subsequent building up of the stub.

Dr. W. A. White, Phelps, N. Y. "A New Method of Adjusting a Porcelain Crown, as Suggested by Dr. I. C. Curtis, Fulton, N. Y."

In the usual method of setting porcelain crowns, the greatest difficulty with which we have to contend is the washing away of the cement by the saliva, necessitating the continual renewing of the former. With the method devised by Dr. Curtis this washing away of the cement seldom, if ever, occurs. The method of procedure is to prepare the root and crown in the ordinary manner. The end of the root is painted with chloro-percha, and a thin suitably-sized disk of Hill's stopping or rubber such as is used for temporary fillings is placed over the face of the root. The crown and pin are then heated and the pin is forced through the disk into the root-canal, and after allowing it to cool is removed. In removing the crown the disk will also come away, and the surplus of the rubber disk is then trimmed off. Again paint the end of the root with chloro-percha, and fill the root-canal with cement. A small amount of cement is then applied to the pin, the pin and the gutta-percha are slightly heated, and the crown adjusted to the proper position. Before removing the pressure allow sufficient time to elapse for the chloro-percha to set, and it will result in a perfect union between the end of the root and the disk, with no cement exposed to the action of the secretions of the surrounding tissues.

Gold Operations.

Dr. L. C. Taylor, Hartford, Conn. "The Effects of Heat in Combining Cement and Gold for Hygienic Fillings."

After placing a small amount of cement into the cavity we proceed to pack the gold directly into the cement while yet soft. The porous forms of such gold as moss fiber, DeTrey's, or Watts' crystal, should be preferred in this connection, as the heat of the burnisher will draw the cement into the little openings in the gold, thereby making a strong retainer. We are told by professional goldbeaters that it takes from sixty to ninety seconds to restore the cohesive qualities, with the gold at red heat. We also find that by bluing the steel instrument it is possible to burnish well-annealed gold foil, piece on piece, without the mallet, a procedure more agreeable to the patient and one which does not result in pitted surfaces.

Dr. C. H. Gerrish, Exeter, N. H. "The Use of Non-cohesive Gold Foil."

Dr. Gerrish demonstrated a method of filling teeth with non-cohesive gold foil, also a method of making combination fillings, finished with Pack cylinders of semi-cohesive gold. Dr. Gerrish also demonstrated in the mouth the use of the napkin in combination with the rubber dam, for the purpose of securing a dry field for work.

The clinician demonstrated the following method of crowning fractured and badly decayed roots. After removing all decay, trim the root. Take a platinum pin, reinforce it by soldering its sides with pure gold, and secure its correct adaptation to the root-canal by hammering on an anvil. Cut a disk of platinum foil a little larger than the face of the root, force and fit it to the surface of the root, and push the pin through it. The disk and pin are waxed together, withdrawn, invested, and soldered, allowing the solder to flow out nearly to the edge. The disk is then trimmed to fit the face of the root, and the remaining stub is cut off. A suitable tooth is now selected. The S. S. White hand-stained teeth are the best, for they are bold and natural in appearance. Grind off the head of the pin, back the tooth with pure gold, fitting it to the platinum cap. The tooth and disk are now waxed together *in situ*, removed and soldered, and as the final result, a crown will have been produced that does not change color and looks like a natural tooth, a pin that fits without any motion, a base of platinum that absolutely fits the irregular root, requiring a minimum of investing material, and the best fitting and most natural crown it has been my delight to construct. The crown is set with gutta-percha. I use for this purpose the Evans gutta-percha outfit.

Dr. J. V. Conzett, Dubuque, Iowa. "Gold Filling Cavity in the Approximal Surface of an Upper Molar or Bicuspid."

Dr. Conzett's clinic consisted in the insertion of a gold filling in the mesio-occlusal surface of an upper left first molar. There was no separation and a previous flat amalgam filling had completely destroyed the interproximal space. The cavity was made according to the Black-Wedelstaedt methods, with flat seats, parallel walls, and no undercuts. The lines of the cavity were extended well into the regions of comparative immunity, and the cavo-surface angle was properly beveled. In making the filling two cylinders of one-quarter sheets of unannealed foil were placed in each angle, a one-half sheet cylinder was placed upon the gingival seat between them, and the whole was thoroughly malleted to place. The unannealed foil was started in the disto-buccal angle and was built up and forward, effectually locking the soft foil to place. A mallet force of about ten pounds to the blow was used throughout, augmented by a hand pressure of about fifteen pounds.

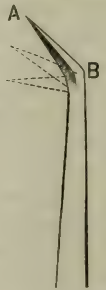
In finishing the filling, the surplus foil in the interproximal space was sawed out with a Black saw, the filling trimmed to shape with Wedelstaedt interproximal trimmers and Black knives, and the filling was polished with sand-paper disks and strips, pumice, and tooth-powder. The interproximal space was perfectly restored, and a good contact obtained with the approximating tooth.

The clinician also inserted a gold-filling in the disto-occlusal surface of an upper left canine. The cavity was prepared according to the Wedelstaedt incisal-anchorage method, in which the disto-mesial third is partially ground down and the gold is built over it. This preparation is used because of the impossibility of gaining access to a cavity in the distal surface of a canine in any other way. The procedure, apart from the difference in cavity preparation, was the same as in the first operation, except that no unannealed gold was used.

Dr. W. B. Dunning, of New York city gave a table clinic, demonstrating the manipulation of strictly non-cohesive gold foil upon the wedging principle; emphasizing the value of that method in the rapid and accurate filling of small simple cavities.

The care necessary to perfectly adapt cohesive gold to the walls of pit, fissure, and other cavities of the class mentioned is well known, and is constantly indicated by the high percentage of failures in such operations, where a "tight joint" would insure permanence for a lifetime. The demonstration was confined to such cavities, because of the facility with which the operation may be perfectly performed. It is not recommended for those of larger size, in which cohesive gold may be used without misgiving. In fact, the exclusive use of non-cohesive gold in large cavities is contra-indicated, because of the great lateral strain caused by the wedging process. The labor necessary to properly condense and finish such fillings increases in direct ratio to the size.

Fig. 1.



Length A to B=13 mm.

The gold used was Abbey's soft No. 4, which retains its non-cohesive property until welded by sheer pressure. The essential instruments were a sharp, smooth-sided, wedge-shaped plugger (Fig. 1) and a small long-handled finishing bur

—the latter used for rolling down or vertically condensing the gold after it had been laterally condensed. These were used under hand pressure—held pencil-wise. The angles of the four-sided wedge were kept sharp and bright by frequent applications to an Arkansas stone, followed by a buff strip.

The cavity was prepared in the usual way, without retaining-pits, and with as little undercut as possible, the walls being nearly perpendicular to the floor.

The gold was rolled by hand into firm pellets, roughly spheroidal or cylindrical in shape according to the convenience of the case. Care was taken to have all free edges tucked in. A pellet was picked up by pressing the plugger point obliquely into it—not tearing or "stabbing" it—and this was carried by a firm side-sweep against that part of the cavity wall (usually at some angle) best calculated to hold the first piece. This was thoroughly condensed laterally with the side of the plugger; that is, from the floor toward the orifice of the cavity, keeping the wall of gold vertical. A considerable surplus was allowed to protrude above the margin. The next pellet was packed in a similar way, either against the first or into some other convenient angle, and this process was continued with other pellets until all the walls were covered with condensed gold, and an opening remained toward the center of the mass, care having been taken to leave an ample surplus. Smaller pellets were wedged into this opening or pit, carried as deeply as possible, and were vigorously packed away from the center until no more gold could be crowded before the plugger point. The entire surplus mass was now brought together by an oblique "tucking" motion of the plugger, care being taken not to tear the gold. The finishing bur was now rolled against the gold in all directions, obliterating the plugger marks and condensing the gold vertically. The inequalities were now roughed off with a file or engine instrument, and the resulting surface was most thoroughly gone over with the plugger, the point being deliberately "stabbed" into the gold, and every effort made to find any soft or insufficiently condensed portion. Such a spot, being found, was converted into a new cavity by plunging the instrument as far as possible into the gold, and filling as before with a new pellet. This surface was again vertically condensed by vigorously rolling the bur from the center of the filling toward the margins, actually sending a little wave of the metal against the surrounding walls, crushing out the plugger marks, and further solidifying the metal already welded by the wedging process. In small fillings, the surface thus obtained may now be carried to a perfect finish by the ordinary means; but bearing in mind the fact that the welding of this gold must necessarily be superficial, any considerable grinding must be followed by further condensing, the whole being worked down until that hard, brilliant luster typical of dense gold is obtained. The finished filling will in every way serve its purpose, as is proved by the longest clinical history of all filling materials, notwithstanding the fact that the body of the filling, removed from the cavity, may be readily pulled apart between the fingers as though made of so many paper wads. Provided the cavity walls are intact, it is obvious that the heaviest stress of mastication can do no more than improve the "fit" of such a filling. If, however, the gold has been properly condensed in the first place, it will "stand up" under the severest usage.

MISCELLANEOUS.

Dr. WILLIAM CONRAD, St. Louis, Mo. "Oral and Dental Hygiene."

Patient, Dr.——. The teeth and gums were in bad condition, there being gingival recession and erosion cavities. The third molars had not been properly cared for. The clinician removed the tartar and stains, dressed and polished the sharp edges of the teeth, and used a ten per cent. solution of silver nitrate on the teeth and gums. The teeth were of unequal length, and were regulated by grinding the occlusal surfaces so as to produce a better appearance, and a more hygienic condition of the oral cavity. We dress and polish teeth to preserve them from injury and to save the lips, tongue, and cheeks from irritation caused by sharp and rough edges.

Three patients: First, Dr.——. Fair teeth, well cared for. Erosion appearing in quite a number of places, and of recent origin. The tartar and stains were removed, and the teeth and gums were treated with a ten per cent. solution of silver nitrate. Polishing was then resorted to in order to make the teeth and gums hard. All sharp edges were dressed and polished.

Second, Dr.——. Bad case of erosion. Every type illustrated. The teeth and gums had been badly cared for. All sharp edges were dressed down and polished. A ten per cent. solution of silver nitrate was used on the teeth and gums, and the teeth were thoroughly polished. The interproximal spaces were cleaned, all tartar deposits removed, and in some cases the interproximal spaces were packed with gutta-percha after having been treated with pure white carbolic acid. The gold filling in the upper left central and lateral incisors should never have been put in, as the erosion had extended far beyond the margins of the fillings. These teeth can be saved even if much neglected, and in but few cases need filling.

Third, Dr.——. Case of pyorrhea alveolaris. Same hygienic treatment used as in the previous cases. A ten per cent. solution of silver nitrate was applied to the teeth and gums, which was followed by hard brushing and polishing. All deposits were thoroughly removed. Devitalize the pulps and fill the root-canals where so required. Pyorrhea alveolaris can be cured, but the teeth and mouth must be placed in a proper hygienic condition.

Conclusions as to the treatment of the above cases, and many others like them, and the results to be expected follow:

The first thing a dentist and a patient must learn is that "clean teeth cannot decay," and the nearer we reach this desired condition, the more wonderful will be the results.

Very few dentists are prepared for this work. They require the help of all available improvements for saving time and avoiding pain, also a lady assistant to carry out this time-consuming work of treating and polishing. There is no substitute for the ten per cent. solution of silver nitrate applied to the teeth and gums as often as the case may require. It is used on all patients where there is need for it, and its application is followed with hard polishing. This treatment will make the teeth whiter, brighter, and harder. Most cases are polished once a week while under treatment. The patient applies the silver nitrate once a day to the teeth and gums during this time at home. The silver nitrate stain is very superficial. It makes the teeth look bad in many cases, but the darker the teeth become, the greater the need for its use. Only decayed or softened enamel takes the stain, as hard or healthy enamel or cementum will not stain. Tincture of iodin will assist in removing the stain from the teeth. Should the silver nitrate come into contact accidently with the hands or face, tincture of iodin followed with aqua ammoniæ will remove it. This treatment will make any tooth whiter, brighter, and harder. Teeth that do not glisten under reflected light are not in a good hygienic condition. When the silver nitrate does not show discoloration of the teeth it is a sign that the patient may temporarily abandon the treatment, but never for a longer time than six months. When the teeth are sensitive to temperature changes, air, or friction, zinc chlorid (Merck's) should be used, as it gives immediate relief. Zinc chlorid is never indicated except for the relief of pain or tenderness. I find "vapocaine" of great value when applied before beginning the treatment. Camphophénique with two per cent. cocain added is used with good results. Camphophénique, two per cent. cocain, and iodin is another good preparation. Chloroform is also good and safe, and when applied to the gums will relieve pain and allay the nervous condition existing in all cases. When it is appreciated that from ten to fifteen drops will produce complete insensitivity in some cases, one will understand why we obtain good results from chloroform.

Young children are more benefited by the ten per cent. solution of silver nitrate than by any other preparation, when applied to the deciduous teeth and to the newly erupted permanent teeth. It does the work and he stands by it because it has helped over many a difficult place. The best tooth-powder is one composed of precipitated chalk and oil of wintergreen (strong) used three times a day on the teeth and gums. In addition a two per cent. solution of carbolic acid may be used, rubbed twice a day on the teeth and gums with a tooth-brush. Orange-wood toothpicks (oval) should be used one or more times a day. Care should be taken not to injure the gums, but the toothpick should be pushed carefully through every interproximal space.

The tooth-brush should be used three times a day on the teeth and .gums. The kind of brush to be used should be carefully selected. He recommends one of moderate size, with many bristles (white) close together, having a good spring, and with no split bristles or wax lines on the back, and with a strong handle. The bristles should be cut square on the ends so that the surface of the brush will be flat. This will reach every part of the teeth and gums. Should a small brush be desirable, cut the bristles to the required length.

Dr. L. S. CHILCOTT, Bangor, Me. "Silver Foil."

This clinic consisted in demonstrating the use of silver foil in filling teeth. The silver foil is used in connection with a forty per cent. solution of formaldehyd for filling the root-canals of teeth, often opening the root, treating with the formaldehyd, and filling with the silver foil at the same sitting. This foil is also used as a lining for cavities in posterior teeth of soft and chalky structure when they are to be filled with gold. The clinician said that he had obtained excellent success with it in covering perforations in roots. The canals are first very thoroughly disinfected with the formaldehyd, and after dipping the silver foil into a ten per cent. solution of formaldehyd, it is placed over the opening. The silver will discolor in the mouth, but will not have that intense black shade seen upon tin fillings.

The principal value of this method of using silver, the clinician claimed, was in the filling of deciduous teeth which are too sensitive to be thoroughly excavated and dehydrated. He makes an opening sufficiently large to gain access, and without any further preparation fills immediately with the silver foil. He has secured as good results with that method as with the so-called "thorough methods," the fillings lasting until the time for the teeth to be shed.

Dr. J. S. DANFORTH, Sheboygan, Wis. "The Use of the Rubber Dam in Setting Bandless Crowns on Anterior Teeth."

The method used by the clinician consisted in applying the rubber dam to the root to be crowned, with the aid of the Ivory labial clamp to hold the tissues well out of the way of the operator. The objects of this method are to force the gum tissue up so far that the joint between the root and the crown will be under the free margin of the gum when the clamp is removed, and when the gum has assumed its normal position; also to prevent lacerating the gum when preparing the root, and to expose to view all parts in the field of operation. The approximate bite should be noted before putting on the rubber dam, and on the six anterior teeth the entire operation can usually be completed before removing the dam. Only in cases of extremely close bite is it necessary to remove the rubber dam to grind the crown for the bite before cementing the crown to the root. In ninety per cent. of cases, the first step in the operation should consist in placing the rubber dam and clamp into position, and the last, in their removal.

The cement can be trimmed much better if it is accomplished before removing the dam.

Dr. J. H. BEEBEE, Rochester, N. Y. "Darby's Tin."

The clinician demonstrated the method of making Darby's tin by means of an ordinary speed lathe and a sharp hand-turning gouge chisel. A quantity of pure tin is cast into a cylindrical form. The cylinder is then placed in the chuck on the lathe and its margin trimmed true and clean of all foreign matter. Then with the gouge fine shavings are made, as fine as possible, almost silken in texture. These are spread on a piece of clean writing paper resting on a flat surface, and another sheet of paper is placed over the shavings. A round object like a lead pencil is then rolled over the upper sheet with considerable pressure, condensing the shavings into a mat. The tin thus prepared is then cut into squares of required size, and is used as a filling material. It works much the same as cohesive gold, and the instruments used are the same as those used for gold. Absolute cleanliness must be exercised during the operation, as the slightest particle of moisture or grease will destroy the cohesiveness of the tin. It is advisable to prepare the tin immediately before using it, as it ages rapidly, and cannot be used after two or three days have elapsed since its preparation, even though it be placed in air-tight receptacles.

Dr. M. L. FAY, Buffalo, N. Y. "Dental Refrigerant."

Dr. Fay's clinic consisted in demonstrating an instrument designed by himself for the refrigeration of the tissues, for aborting incipient alveolar abscesses, etc. The objection to holding a piece of ice against the cheek is that it does not reach directly the locality where the cold is mostly needed. Dr. Fay showed that with his apparatus the cold could be applied directly to the affected parts.

Dr. A. L. HAAS, Des Moines Iowa. "An Original Method of Obtaining Perfect Adaptation to the Root in Crown Work."

This clinic consisted in a demonstration of the use of an instrument, the Ivory root-seat swager, and of a method for quickly and accurately adapting a metal fitting to the end of a root that has been prepared for a "post and plate" crown. The root is ground off even with the gum lingually and approximally, and slightly under the gum labially, and the enamel is scaled off all around. The canal is enlarged and deepened for the post. If a porcelain crown is to be made, a piece of No. 33-gage platinum is selected, and burnished or adapted to the root-end, the post hole located, and a hole punched through the platinum. The post is forced through the platinum and the two pieces soldered together. The fitting is now burnished and adapted to the end of the root as well as can be done with the hand burnishers, and is then thoroughly annealed. The proper size cup is now selected, and two or three layers of pink vulcanite rubber are placed in it, and trimmed to the edge. This instrument is now firmly pressed against the fitting, and while the pressure is being applied the handle is given a dead blow with a lead mallet. The suddenness of the blow will accurately drive the metal home in perfect adaptation to the root-end. If a gold-backed crown is to be made, use about No. 32-gage pure gold. The instrument is simply a final adapter to be used after the fitting has been made as well as can be done by hand burnishing.

Dr. H. E. KELSEY, Baltimore, Md. "Cases of Irregularity Involving in Their Correction the Use of Intermaxillary Reciprocal Force."

Dr. B. S. HERT, Rochester, N. Y. "Filling a Disto-Occlusal Cavity in an Upper Right Second Bicuspid."

The cavity was prepared according to Dr. Black's method, except that a shallow groove was made in the upper third of the buccal and lingual walls. A flat matrix was then inserted, passing slightly above the gingival wall of the cavity, and extending to within about one millimeter of the occlusal surface of the adjoining molar. The matrix was held in place by means of a soft pin wedge, the gingival part being broad enough to hold the matrix against the tooth, and the occlusal being shaped to a knife-edge. In filling, the entire floor of the cavity was covered with a layer of tin, then soft foil was added until the cavity was about one-third full. The surface of this part of the filling was left flat like the underlying floor of the cavity. The balance of the filling, both the approximal portion and the occlusal step, were then finished with cohesive foil. After removing the wedge and matrix, the filling was finished with burnishers, trimmers, strips, etc.

With a filling inserted in this way very little time is required to finish the cervical portion, and the contact point can be made as perfect as desired.

Dr. Ira J. Coe, Baldwinsville, N. Y. "A New Feature in the Retention of Gold Fillings."

Although the use of soft cement under gold has been severely condemned, the clinician endeavored to demonstrate that this method has many points of merit.

In the first place, the cement is allowed to set thoroughly before attempting to condense the gold. This, it seems to him, would satisfactorily overcome the objection that a blow sufficient to thoroughly condense the gold would certainly powder the soft cement. But this difficulty is overcome by using a quick-setting cement. So far as he has been able to discover, the best cement for this purpose is the Ames special inlay cement, which will set in about two minutes. No time is lost, for during the interval the margin can be carefully freed from cement.

The clinician demonstrated the method under consideration upon a large compound cavity in the mesial surface of an upper right first bicuspid. In the preparation of the cavity the mesio-buccal and the mesio-lingual angles were included, and to more securely anchor the filling as well as to preclude the possibility of future decay, the sulcus was cut out. The pulp had been previously devitalized, and the root contains a good filling.

In a case where the tooth contains a vital pulp which needs more protection than the cement affords, it is advisable to put a wafer of gutta-percha in the floor of the cavity, after having previously coated the under surface of the wafer with a good cavity varnish. By this method he had successfully filled over newly exposed pulps, in which cases he always makes a concavity in the under surface of the wafer with a ball burnisher, and wait for the cement to set very hard before adding the second piece of gold, always exercising great care in packing the gold over the exposed portion. If the pulp is in a healthy condition, and if it has not been infected during the operation—performed without pain through pressure—there is every reason to expect a satisfactory result. In the few cases upon which he has operated in this manner, no discomfort has been reported.

In all simple cavities the adhesiveness of the cement is alone amply sufficient to retain the filling, but in a compound cavity including a portion of the incisal or occlusal surface, he advises the securing all possible anchorage in addition to that afforded by the cement, being careful not to allow the latter to fill the undercuts or dovetailed spaces.

In the case under consideration he would not allow the cement to flow into the sulcus, but if this tooth contained a vital pulp in need of every possible protection he would then have applied just enough cement to cover the floor of the sulcus. In all cases, except in very deep simple cavities, use just enough cement to thoroughly line the cavity with a thin film. Apply the cement with a flat amalgam instrument of suitable size and shape, and press the first layer of gold to position with the same or a similar instrument. While the first layer of gold is being pressed firmly to position, all excess cement will be forced out at the margins of the cavity, and a little practice will enable one to do it in such a way that but little surplus of cement will be squeezed out.

Allow the cement on the slab to set before proceeding with the filling. It is invariably necessary to insert the first layer of gold while the cement is still in a thoroughly plastic state, for if it should become slightly stiff it will surely crumble under the pressure incident to the packing of the gold. In large cavities so situated that they are not directly accessible, it is preferable to apply the cement and a layer of gold to one portion of the cavity, and then after preparing a fresh mix of cement, to apply it to the remainder of the cavity. If the proper instruments, however, are used this is seldom necessary.

Only recently one of our venerable gold-workers pointed out the fact that it is very easy for the best of us to insert a very pretty gold filling just a trifle smaller than the cavity.

This he thought especially true of the class of small cavities which have to be reached from the lingual aspect. In fact he felt these cavities had annoyed him more than any others, but by using cement, the filling is easily started and completed with one hand, the left hand being used to hold the mirror. These cavities require no retaining grooves or points. He prefers cement to any form of cavity varnish or lining, because when the cement has set it is easily removed from the margins, as it is not sticky and is easily discovered by its color.

The strip form of Watts' crystal gold is, he believes, the most convenient form for this work, and if proper attention is given to its condensation, the completed filling will have a smooth and more durable surface.

This method is especially adapted to frail teeth, because the cement supports the weak enamel walls and gives them a good color. In cases where the labial wall of an anterior tooth is quite firm but transparent, the results are especially satisfactory. Another feature in favor of this method is that it does away with the necessity for wedging the gold between the walls; instead, it may be condensed directly against the floor of the cavity. This is of special advantage in the treatment of delicate and brittle teeth.

Clinic of the G. V. Black Dental Club of St. Paul, Minn., before the National Dental Association, July 26, 1905.*

First Day.

Dr. A. G. Fee, Superior, Wis. (Reported by Dr. Alfred Owre, Minneapolis, Minn.). "Gold Filling." Mesial cavity, involving the incisal angle of an upper right central incisor, making a step preparation necessary.

Separation had been partially obtained with gutta-percha for a period of five days previous to the operation. There was a slight overlapping of the incisal angle and an end-to-end bite. The Black system of cavity preparation and filling was used. No. 4 Ney's cohesive foil in one-sixteenth and one-thirty-second sized pellets was used. Small plugger points were generally used, with hand pressure, the mallet wielded by an assistant—a lead-filled leather face mallet being the instrument used. The time of the operation was two hours and fifteen minutes, as follows: Adjusting dam and preparation of cavity, thirty minutes; insertion of gold, sixty minutes; finishing, forty-five minutes.

The filling was built to an ideal normal contact with opposing tooth (originally overlapped), thus establishing a normal interproximal space with a view to a growth of healthy gum tissue to fill it.

Dr. G. N. Beemer, Mason City, Ia. (Reported by Drs. Griswold, Parrish, and Cowan.) "Gold Filling." Cavity in the disto-occlusal surface of an upper right first bicuspid.

In preparing the cavity the Black and the Wedelstaedt selection of cutting instruments were used. The filling was started in the approximal surface with non-cohesive gold. Three cylinders in all were used, one containing one-half sheet of No. 4 gold, the other two one-quarter of a sheet each of the same gold. The filling was then completed with pellets of cohesive gold, which contained one-sixteenth and one-thirty-second of a sheet of No. 4 gold. One plugger was used throughout the operation. When the gold was all in the cavity, condensing pluggers were used. The finished filling presented a pronounced contour. When, however, the cavity in the mesio-occlusal surface of the adjoining bicuspid was filled by Dr. Clack, a perfect contact was established, a thing so rightly sought by the members of the Black Club. In the opinion of the committee two corrections were necessary. It might have been well for the operator, on completing his cavity preparation, to have sterilized or dehydrated the cavity; and the burnisher should have been used on the completed filling.

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* The operations made by the members of the G. V. Black Dental Club of St. Paul were reported by the members of the Livingston County Dental Society of New York.

Dr. W. R. CLACK, Clear Lake, Ia. (Reported by Dr. Wilson.) "Gold Filling." Cavity in the mesio-occlusal surface of an upper right second bicuspid (same patient for whom Dr. Beemer operated).

So far as cavity preparation, placing the gold, etc., were concerned, the operation made by Dr. Clack was very much like that made by Dr. Beemer. Both fillings were made to withstand the heaviest stress of mastication. The small points of contact would give no lodgment to anything, while the form of the lingual and buccal embrasures was of such a nature as to deflect food away from, rather than into the interproximal space and against the gum septum. These fillings were examples of scientific dentistry.

Dr. K. E. CARLSON, St. Paul, Minn. (Reported by Dr. J. J. Scott.) "Gold Filling." Cavity in the mesial surface of an upper right lateral incisor, involving the incisal edge.

Preparation: Chisels were used to remove all frail and overhanging enamel not supported by sound dentin. The decayed dentin was all removed. The incisal surface of the tooth was then ground. Retention was obtained by making slight grooves with a small inverted cone in the gingivo-axial angles and in the dentin in the incisal surface.

Cohesive gold was used throughout the operation. One plugger was used with which to pack the gold. Hand malleting was also used from start to finish. The completed operation was a beautiful, almost perfect filling, with good margins and contour.

To my mind, in this case a porcelain filling properly made would have been far more artistic and probably as lasting.

Dr. A. C. FAWCETT, Rochester, Minn. (Reported by Dr. Povall.)

Dr. Fawcett was unable to obtain a patient, so he spent his time in giving a table clinic. He displayed a large number of plaster-of-Paris casts, which illustrated abnormal conditions in so far as these related to failure of dental operations. In other casts he illustrated the restoration to normal conditions that his operations had brought about. His clinic was most instructive and interesting.

Dr. J. H. CONZETT, Dubuque, Iowa. (Reported by Dr. Bradley.) "Gold Filling." Cavity in the mesio-occlusal surface of an upper left first molar.

The preparation and method of filling this cavity were in all particulars so very similar to those prepared and filled by Drs. Clack and Beemer that it would be mere repetition to describe it in detail.

The same can be said of the clinics by Dr. F. S. JAMES and Dr. J. W. S. GALLAGHER of Winona, Minn. (reported by Drs. Allen and C. J. Fraley), who made very large operations with gold in bicuspids and molars.

It would have been impossible for one to believe, unless he had seen it, that so many operators could have been obtained who used the same methods, instruments, etc. All the completed operations had the appearance of having been made by the same operator.

Dr. G. D. MOYER, Montevideo, Minn. (Reported by Dr. Moore.) "Gold Filling." Cavity in the mesial surface of an upper right lateral incisor, involving the incisal angle.

The cavity was prepared and filled in the same manner as was the case operated upon by Dr. Carlson, with one exception. As the lateral incisor showed much incisal wear, Dr. Moyer removed sufficient tooth-substance on the incisal surface to make room for a very large mass of gold. The gold for this part of the tooth was very thoroughly condensed. The completed operation showed a beautiful operation which for years to come should do good service.

Dr. A. C. SEARL, Owatonna, Minn. (Reported by Dr. J. W. COWAN.) "Gold Filling." Cavity in the mesio-occlusal surface of an upper right first bicuspid.

The same method and details were displayed as in the operation made by Dr. Beemer. (See page 564.)

After finishing the filling on the occlusal surface, a separator was adjusted, and the teeth were moved apart. The point of contact was then polished. On removing the separator the teeth resumed their natural positions.

Second Day.

Dr. A. C. SEARL, Owatonna, Minn. (Reported by Dr. Scott.) "Gold Filling." Cavity in the mesio-occlusal surface of an upper right second bicuspid.

The walls of the cavity were well extended lingually and buccally. The gingival seat was made flat. The walls were made parallel and the cavity was extended well across the occlusal surface. No matrix was used. Non-cohesive gold, in the form of cylinders, was used for filling the gingival third of the cavity, and the operation was completed with cohesive gold.

The filling was then finished. The entire operation took but one hour and twenty minutes. A fine filling with good contour was the result. Had a matrix held in position by a good separator been used, as good a contour could have been made. Certainly the finishing would have been much easier for patient and operator.

Dr. G. D. MOYER, Montevideo, Minn. (Reported by Dr. Povall.) "Amalgam Filling, demonstrating the Method of Using the Black Matrix in connection with the Wedelstaedt Tie."

The cavity preparation was along the lines laid down by Dr. G. V. Black, and as a demonstration of his method from a practical and scientific standpoint was a complete success. The seating of the filling and the step anchorage in the occlusal surface are, to my mind, marked advances in the art of filling teeth. I have a profound impression that a cavity prepared and filled as Dr. Moyer prepared and filled this cavity, presupposing that the filling be mechanically perfect, would preserve the tooth for all time so far as human agencies can interpose.

The Black matrix with the Wedelstaedt tie is a most efficient accessory. The matrix is adapted to each particular cavity, and it enables an operator to make a proper contact, so essential to a perfect filling. Before adjusting the rubber dam, the dam was marked with a blue pencil. The holes were then burned through the dam—an improvement on the dam punch, for each hole was reinforced with a rim of melted rubber.

Dr. F. S. JAMES, Winona, Minn. (Reported by Dr. Kuhn.) "Gold Filling." Cavity in the mesio-incisal surface of an upper right canine.

At the first day's clinic Dr. James made a gold filling for this patient in the mesio-occlusal surface of an upper right second bicuspid, the tooth having previously been filled with amalgam. The disto-occlusal surface of the adjoining first bicuspid was also filled with an amalgam filling. It was the intention of the operator to remove the amalgam from the first bicuspid and make a gold filling, so as to demonstrate to the greatest extent possible the methods followed by the members of the Black Club; but on removing the amalgam a large mass of decay was found in the cavity. When the decay was partially removed it was at once observed that any more operating on the tooth would expose the pulp, so Dr. James prepared and filled a cavity in the canine. All-cohesive gold was used to make the filling. The cavity was prepared with right-angle anchorage. When the filling was condensed, a saw, about the size of a horsehair, was placed in a Black saw-frame, and the surplus gold along the gingival margin was removed. Three cuts were made with the saw. The Black No. 8 knife was principally used to trim the filling to form.

Dr. J. W. GALLAGHER, Winona, Minn. (Reported by Dr. C. J. Fraley.) "Amalgam Filling." Cavity involving both mesial and distal surfaces of a lower right second bicuspid.

The operator announced that he had been requested to make a special operation in the disto-occlusal surface of a lower bicuspid, as all the other gold operations which had been made by the members of the Black Club had been made in teeth in the maxilla.

After adjusting the rubber dam and dehydrating the teeth, he removed an amalgam filling which was in the disto-occlusal surface of the second bicuspid. The previous operator had not removed the decay prior to placing the amalgam in the cavity. On removing the decay Dr. Gallagher found the pulp involved. Cocain anesthesia was used, the pulp was removed, and the root-canal was filled with gutta-percha. In preparing the cavity in the distal surface a cavity of decay was also found to exist in the mesial surface. The operator prepared both cavities, cutting a step entirely across the occlusal surface of the tooth and bringing the occlusal margin of the cavity up to the lingual and buccal marginal ridges. He then placed a thin strip of copper completely around the tooth, and with a Wedelstaedt tie secured it to place. The cavity was then filled with quick-setting amalgam. When the amalgam had become hard, the thread which held the matrix was cut and the matrix removed. The filling was then trimmed to form and polished.

Unless it could be seen, few people would believe that such small points of contact could be made on an amalgam filling. To all appearances the completed operation seemed as good as any of the operations which had been made with gold, the only difference being in the color of the material used.

Dr. A. C. FAWCETT, Rochester, Minn. (Reported by Dr. Allen Fraley.) "Gold Filling." Cavity in mesio-occlusal surface of an upper left first molar.

The cavity was prepared in the most careful manner possible. The margins were extended until sound unaffected dentin was reached. The gingival seat was made flat. A step anchorage was made in the occlusal surface. The method of filling was the same as used by Drs. Searl, Beemer, etc. The completed operation showed the handiwork of a master workman, every surface being smooth and highly polished, the contact point perfection itself, and the occlusion correct.

Dr. J. V. CONZETT, Dubuque, Ia. (Reported by Dr. Povall.) "Gold Filling." Cavity in distal surface of an upper left canine, involving the incisal angle.

The cavity was prepared with a right-angle anchorage. Cohesive gold was used from start to finish.

Dr. K. E. CARLSON, St. Paul, Minn. (Reported by Dr. Bradley.) "Gold Filling." Cavity in distal surface of an upper right central incisor, involving the incisal angle.

The cavity preparation did not differ from that which the same operator made in his operation of the previous day. The gingival seat was flat. The step in the incisal surface was ample for retentive purposes. Cohesive gold was used. The filling when completed was a most artistic piece of operative work.

Dr. W. R. CLACK, Clear Lake, Ia. (Reported by Dr. Scott.) "Gold Filling." Cavity in disto-occlusal surface of an upper right second bicuspid.

This operation was made along the same lines as those already described.

Dr. G. N. BEEMER, Mason City, Ia. (Reported by Dr. Wilson.) "Gold Filling." Cavity in mesio-incisal surface of an upper right central incisor.

This operation was almost the same as the one made by Dr. Carlson, and a description seems unnecessary. In all particulars it was as perfect as could be made.

Dr. P. H. JONES, Clear Lake, Ia. "Gold Filling." Cavity in distal surface of an upper right canine.

On reaching the chair when Dr. Jones was operating, your reporter found that the operator had shortened the tooth for the purpose of making a right-angle anchorage in the incisal surface. How far the decay had involved the disto-occlusal angle is not known, because of that angle having been cut away prior to the reporter's seeing the case.

The completed operation was a beautiful large gold filling, of great density and good form, and it should preserve the tooth for all time to come.

Dr. H. J. BEEMER, Newton, N. J. "Gold Filling." Cavity in mesio-occlusal surface of an upper right second bicuspid.

In all the other operations made by those working under the Black standard, the hand mallet wielded by an assistant was used. But in this operation a small 5 mm. almost straight plugger point was used in an automatic mallet.

The completed filling did not differ from those made by the other operators. In form, contour, point of contact, and in other essentials, it is most excellent.

(To be continued.)

FIRST DISTRICT DENTAL SOCIETY (N. Y.) AND NEW YORK ODONTOLOGICAL SOCIETY.

Union Meeting, October 23, 1905.

A COMBINED meeting of the First District Dental Society of New York, and the New York Odontological Society was held on Monday evening, October 23, 1905, at the Berkley Lyceum Theatre, 19 West Forty-fourth street, New York city.

Dr. A. L. SWIFT. We are highly honored this evening by the presence of our distinguished fellow countryman, Prof. W. D. Miller of Berlin. Although many of us have never before had the pleasure of listening to his voice, we have followed his profound scientific researches with such intense interest, and his distinguished writings and teachings have been so widely read and quoted and have so dominated our theories, that we feel as though we had always known him.

I take great pleasure in introducing to you Prof. W. D. MILLER, who will read a paper entitled "Symbiosis, with Particular Reference to the Bacteria of the Alimentary Canal."

On rising to read his paper, Professor Miller was greeted with prolonged applause.

[Dr. Miller's paper is printed in full at page 528 of the present issue of the COSMOS.]

Discussion.

Dr. E. C. KIRK. I want to thank you for the compliment which you have paid me in asking me to open the discussion on this very interesting paper; but let me say in the beginning that my principal qualification for that task is my lack of knowledge of the subject. In fact, I knew very little about symbiosis until Dr. Miller arrived here. I found his head was filled with symbiosis, and we had a few talks about it. I had heard, of course, of the agricultural experimental work upon the nitrifying bacteria, but my knowledge ended with the account of those experiments, and all I can hope to do tonight is to give you some impressions of what I have heard of the matter.

My ideas upon the application of the meaning of the term symbiosis have been largely modified since I came into the hall this evening. I had heretofore regarded symbiosis as a much more specialized relation than has been portrayed by the essayist. I had regarded it as a more organic and intimate connection than has been shown, that is to say, organic in the same sense as that subsisting between the nitrifying bacteria and the leguminous plants. But when the relation between the barnyard and the farmer, or the farmer and the residents of his barnyard, is referred to as a possible instance of symbiosis, I feel that the term is something like charity, which we are told covers a multitude of sins.

In regard to the question which I believe interests us most—the possible symbiotic relation of intestinal bacteria to man or to the mammalian animals—I understand that the evidence in favor of such a view is based on the experiments of Schottelius and those who have followed his lead. I could not help feeling, as I listened to the account of those experiments, that it was asking a great deal of a chicken to incubate, or even live at all, in the circumstances under which the experiment was made. Sterilizing the shell of the hen's egg, then hatching out the infant chick in a sterile incubator, and feeding it upon sterilized food, is putting a severe stress in the beginning upon that organism. It involves a stress because it is throwing the organism into an environment other than that which is normal to it, and expecting it to develop under conditions which do not closely approximate normality for that organism. Therefore I should say that such an organism started into life sadly handicapped.

I have a symbiotic hen-yard myself, and have done a great deal in the matter of raising chickens and hatching eggs both naturally and artificially, and have faithfully tried the incubator, but I still believe the good old-fashioned way is best. There has been no more stupid animal ever created by the Almighty than a hen; yet I am convinced she knows more about hatching chickens and raising them successfully than I do.

Still, we must take this experiment seriously, for I assume that the experiment of feeding the chick sterilized food, and then feeding it infected food, was carried out under precise conditions for the purpose of comparison of results. It must necessarily have been so, and we have the important observation that under conditions of feeding it infected food, the sterilized and badly handicapped chick did show symptoms of thriving. What does that mean? From the viewpoint of one who has given some attention to the ways of nature, I should be inclined to apply here the definition that Mr. Herbert Spencer gave of organic life—that we must regard life as the continuous adaptation of internal relations to external relations. It means the chick hatched out under the conditions of the barnyard, and subject to immediate infection at birth or hatching, and living upon infected food, is by adaptation to these conditions still able to survive and live its normal life but as I understand it the chick does that in spite of the bacteria, and not because of them. It seems to me to be simply a case of adaptation on the part of this chicken's organism which enables it to deal with the bacterial problem successfully. It is a case of the survival of the fittest, under those particular conditions.

Nature does not go by leaps and bounds in her changes. She proceeds gradually. Here is the normal case of the adaptation of the chicken to a bacteria-infected environment. But the learned scientist suddenly and drastically alters these normal conditions by removing the chick from its habitual environment, and then asks it to live, forsooth, as well that way as the other way. He has not proceeded as in the gradual way of nature in adapting his chick to the prenatal influences of sublimate and the unnatural conditions of the incubator. It seems to me that principle should be taken into account in estimating the value of the array of experiments made by Schottelius and those who have figured along this line of investigation.

With regard to the question which Dr. Miller has raised as to the possible usefulness of these intestinal bacteria, because of the known fact that they are able to produce something to promote the digestion of peptones, etc.: From the fact that certain intestinal bacteria can do that, and because the human body also provides for the same process by the secretion of certain glandular structures of the body, the assumption has been advanced that this bacterial action may be useful to the human organism. I think Dr. Miller has sufficiently answered that, and yet I want to present a view which occurred to me as I sat here. Why is it necessary if the body has provided for this through the action of glandular ferments—those substances capable of splitting up or breaking down proteid foodstuffs—why in the economy of nature is it necessary to have bacteria do more of it? And that called to my mind a statement made by a friend of mine, a scientific investigator, who got into a debate with a lady. The lady was defending the question of miracles. I was an ear witness to the conversation. The agnostic was taking the other side of the question. She said, "There are things happening every day—taking place right in your laboratory—as wonderful as any miracle ever recorded. The agnostic said, "True, but I have been studying nature many years, and while I have known her to do many wonderful things I have never yet known her to do a ridiculous thing."

It does seem that that same thought applies here. Here is the human organism which has made provision for the constant, we will say possibly sufficient, production of the enzymes—ptyalin, pancreatin, etc.—then would it not be a rediculous thing to call in of necessity—though she may incidentally do it—these bacteria for the purpose of producing sufficient additional pabulum for maintaining the body of its normal plane of vitality? I cannot help feeling in regard to our relation to the element of parasitism, that we survive in spite of them by developing a tolerance of them, not that we are dependent upon them, but having by adaptation developed this tolerance, it is conceivable that the sudden withdrawal of them may cause a sudden jolt or break in our normal equilibrium for the time being.

We had given us a very beautiful picture by Dr. Miller of the adaptation of the organism to environment, in the case of those nitrifying bacteria which exhibit the most pronounced symbiotic relation to certain plants, when he told us that Knobbe, the discoverer of B. radiciola, was unable to make a practical success of the inoculation of the soil in Germany, because he had fed the bacteria on food rich in nitrogen, and that this same overfed, luxurious German microbe, having all the nitrogen it wanted, was incapable of working; but when we got it over here in Washington, and brought it up on rather more democratic principles, we compelled it to work for its living and in so doing got it to do what was wanted, thus producing a change of function which was of immense practical value to the agriculturalists of this country and of the world over.

As bearing upon this question of adaptation of the organism to its environment, I wish Dr. Miller had dealt with that to somewhat greater length. It seems to me that there is an enormous field for study in connection with the question of adaptation of the organism to contact with disease-producing germs. Dr. Miller spoke of the wide travels of syphilitic infection. It is a well-known fact that the type of syphilis today is tremendously modified in its clinical expression, as compared with the accounts we read of its manifestations fifty or one hundred years ago. What is the reason? It must mean that we are becoming less and less susceptible to it. A certain adaptation to syphilitic tendency in communities has apparently occurred, and people do not react toward infection with this terrible disorder to the same degree as previously. We know what it means in a community that has never had syphilis before; where new ground is infected in that way, the ravages are something horrible to contemplate.

On the other hand, let us not forget the immense amount of evidence we have of a positive character, no little portion of which has been brought down to the point of demonstration by the gentleman whom we honor tonight. There is all of that field with reference to the infection of the mouth, where we have evidence that the infection of the human organism via the mouth and through the intestinal canal is not always productive of good, and we may well ask, Is any of it good—or, if so, how much of it is good?

I wish to express very sincerely my appreciation of the opportunity I have had to listen to the thought expressed on this subject by the distinguished essayist of the evening. It is highly suggestive in its possibilities, not only for us, but for humanity at large.

Dr. A. W. Harlan. We must look at a subject of this nature from different viewpoints, and as I stand before you tonight and think of the work that has been done in bacteriology, beginning long before the time of Lister, and extending step by step through the hands of such men as Lionel Beale, and one of his most vigorous opponents, Bastian, covering the period of the activity of Pasteur and the opposition of Liebig, to the former's contention that the production of vinegar, for instance, was of microbic nature—thinking in that way of the work that has been done by the various workers in this line, we come to the point where it remained for Miller to first produce that monumental work entitled "Micro-organisms of the Human Mouth."

If one should peruse a brief epitome of the history of medicine covering all of the work that since time immemorial has been accomplished by anatomists, physiologists, and microscopists, we shall find that it was left for our distinguished countryman Miller to produce the first connected and consecutive treatise on bacteriology, his "Micro-organisms of the Human Mouth."

Tonight he has presented so many thoughts that I feel that even with what little I know of the subject, it would take hours to go over the points he has touched upon so easily and carefully, so scientifically and knowingly—having them at his finger tips, and ready at any moment to present a new phase of this subject.

I thought after reading the synopsis of his proposed lecture that I would undertake to say something about the intestinal aspect of such bacteria as are found below the stomach. It seems reasonably conclusive from what Professor Miller has said, that the rôle of the bacteria below the stomach is *nil*. His thoughts and speculations in that respect are very clear especially those with reference to the myriads of bacteria that lose the power of peptonizing—and consequently, those that pass through, dead or alive, do no particular damage to the intestine of the individual. Unless there be a specific bacterium that in a certain state enters a human body not immune to that bacterium, they are all innocent.

Another point that I dwelt upon with some emphasis in the few days I have had to look over the subject, was the comparative lack of necessity for the use of antiseptics and disinfectants in the human mouth. That is a matter which needs to be clarified. Many of us have had the thought that in order to make our patients save their teeth forever and ever, all that was necessary was to dose them with various and sundry drugs of varying strengths. I have been of the opinion that it was not necessary to feed the mucous membrane of the mouth with so many strong antiseptics and disinfectants, and so I have been pruning them out and trying to get them down to the fewest number, and then only using them when there seemed an absolute necessity for it. The shotgun prescription for a mouth-wash or a mouth-disinfectant is growing less and less in favor, and I am glad to see that the work of Professor Miller is leading us in that direction.

I made a few notes that I intended to dwell upon in this connection tonight; but I feel that in face of the immensity of the value of this address they would be the feeblest kind of tribute to the mass of learning Professor Miller has projected at us, and it is almost impossible to point out any one thing, except this: If we were able to do what the United States government has been doing to enrich fields by planting a bacterium, we might plant a bacterium in the mouth that would be more antagonistic to those that produce dental caries than they are to each other; then perhaps we would be able to destroy the bacteria that produce lactic acid and similar agents which destroy the teeth, and thus use the specific bacterium as a prophylactic agent, rendering the mouth immune, and thereby save our teeth, as has been proposed in connection with other diseases.

In this connection I wish to say that the matter of disinfection at present is becoming more simplified every day, and in view of the recent investigations that have been made of the methods of destroying the bacillus of typhoid, dysentery, and Asiatic cholera, and some cocci, streptococci, and staphylococci, we might be able in the future to destroy in a simpler manner the virulence of such organisms, and the poisonous effects of their products; all of this being, of course, in accordance with the studies of Professor Miller on symbiosis.

Dr. S. G. Perry. I would not for a moment presume to speak upon a subject about which I know so little; it would not be at all becoming. There was a time twenty-five years ago, when I gave considerable attention to the microscope, and when I would have been more ready to venture a guess or an opinion than at the present time; but I will say one thing briefly—I am very much gratified to see that Professor Miller's course has tended in the direction of agriculture, and I am glad to see that Dr. Kirk has shown a tendency toward the cultivation of the chicken. I think we shall yet know them as scientific farmers, as well as good dentists.

Dr. Nash read a communication from Prof. Eugene H. Smith, Dean of Harvard University Dental School, regretting his inability to be present.

Professor Miller. I have very little to say in closing the discussion except to thank Dr. Kirk and Dr. Harlan for their very kind treatment of my paper.

There are one or two points upon which I might perhaps touch especially in reference to the experiments of Schottelius. These were carried out with the greatest care and seem to me to be fairly conclusive as far as chickens are concerned. The conditions of experimentation were perhaps not quite as artificial as Dr. Kirk has portrayed them. The treatment of the eggs with sublimate does not appear to interfere with the hatching of the egg or the integrity of the chick. It is applied only long enough to destroy the bacteria on the outside of the shell, and the egg is afterward washed with alcohol until the last trace of the sublimate is removed. The fact that eggs so treated hatch out normally indicates that the treatment is not deleterious. Again, chicks hatched artificially thrive, as far as I am aware, about as well as those hatched by the hen. In the experiments of Schottelius the chicks hatched out perfectly normally, developed a perfectly normal appetite and grew perfectly well when bacteria were admitted to the alimentary canal; without the bacteria they perished—and we are accordingly forced to the conclusion that bacteria are essential to the health and life of chicks.

Even after the chick is some days old and is rapidly going down-hill, it suffices to introduce a bit of hen manure, or dirt from the hen-coop, to its food, to see it revive and develop normally. This indicates to my mind an important function on the part of the bacteria, and this is the usual interpretation of the experiments of Schottelius.

I fully recognize, however, the significance of the point brought out by Dr. Kirk. We have abundant evidence of the fact that a man may by continued use even of virulent poisons become so accustomed to their effects and so adapt himself to them that their sudden withdrawal will be accompanied by a serious disturbance of equilibrium. An old smoker will take a dose of nicotin, and even be miserable without it, which would kill a beginner in the art of smoking, and the sudden and absolute withdrawal of morphin from the confirmed morphinist is often accompanied by alarming symptoms which can be relieved only by administration of the poison to which his whole economy has become so accustomed that it now demands it. In a like manner we may understand how chickens, and birds in general, which have been living for untold generations with bacteria in their alimentary canals have become so accustomed to them and have so adapted themselves to the conditions which these bacteria produce, that a sudden withdrawal may produce disastrous results. If it were possible to eliminate the bacteria gradually from the alimentary canal, arriving at a total extermination after a long series of generations, we might produce a chicken so constituted that it would grow equally well, possibly better, without bacteria.

With respect to the diminution of the virulence of syphilis, I am inclined to think that it may be accounted for in a different way. It is claimed that about one-quarter of the human race bear the trace of syphilis, either in its active stage or in some one of its manifold after-effects. It is, however, doubtful to my mind whether the diminished virulence of the disease is to be accounted for by this fact. We know that when Europeans go to India and contract syphilis there, they suffer from it in a very aggravated form, the disease often taking an acute character and resulting fatally in the course of a few weeks. I have seen it stated that some of the English regiments in India have been decimated by syphilis. German soldiers, infected in China during the late campaign, suffered in a manner similar to the natives, and brought back with them a very virulent type of the disease. From this it appears that Europeans are not becoming gradually immune to the disease, but that the disease itself as manifested in European countries is becoming less virulent, which I account for in the following manner: We know that there are various ways in which an attenuation of the virulence of disease germs may be brought about; for instance, by cultivating them under unfavorable conditions as to temperature, composition of the culture medium, etc. Likewise slight traces of antiseptics, not sufficient to prevent the development of pathogenic bacteria, will cause a diminution of their virulence. Now if we treat a person suffering from syphilis with mercury we bring about a diminution of virulence of those germs that are present in his tissues, and a second person infected by him will suffer from a milder form of the disease.

In like manner, if this second individual is going through a course of treatment, a third person infected from him will manifest a still milder form of the disease, and so on from generation to generation, and I am strongly inclined to believe that any regulations providing for the immediate and thorough treatment of all persons infected with syphilis, would in the course of a quarter of a century do very much to rob the germs of their virulence and the disease of its ravages.

With respect to the rôle of antiseptics in the human mouth there is a great deal of truth in the remarks made by Dr. Harlan. When it was first discovered that certain substances, even in a highly diluted form, possess the power of restricting or inhibiting the growth of bacteria, we thought that we had discovered an efficient means of combating disease. Experiments and experience, however, soon showed us that, as far as general diseases are concerned, antiseptics have but a restricted usefulness, and if we wish to render the human body immune to infection by the use of antiseptics we would be required to inject into it at least six times the fatal dose; *e.g.* if a pathogenic bacterium had found its way into the blood of an animal, in order to destroy it we would have to inject six times as much carbolic acid as would be necessary to destroy the animal itself. With other antiseptics still less favorable results were obtained. The conditions for the use of antiseptics in the human mouth are naturally much more favorable than in the case just referred to, and yet we have been able to accomplish but little. We either do not reach the centers of infection when we rinse the mouth, or our antiseptic is in so weak a solution that its action is reduced to a minimum. In most cases, too, the bacteria will be so embedded in mucus, fat, etc., that the antiseptic scarcely comes into contact with them. An antiseptic mouth-wash, I am convinced, would be of use, if we could prepare one which would not injure the teeth or the mucous membrane more than it does the bacteria. The antiseptics available for preparing mouth-washes are but few in number. Either they are poisonous or injurious to the teeth or mucous membrane, or have a bad taste or some other property which prohibits their use in the mouth. Personally I make frequent use of a mouth-wash having the following composition: Saccharin 3, benzoic acid 4, tincture of eucalyptus 25, alcohol 100. With this mouth-wash it is possible to devitalize pneumococci in the human mouth or at least to so attenuate their virulence that they cease to be pathogenic for mice. (See DENTAL COSMOS, 1891, vol. xxxiii, p. 917.) I have obtained most beneficial results with this mouth-wash in the case of various ulcerative processes of the mucous membrane of the cheeks and gums. Its intensely sweet taste renders it unfit for a daily wash.

The idea of planting bacteria in the mouth is a very interesting one, and the attempt has been repeatedly made to apply this principle (bacterio-therapy) in the treatment of disease. An Italian investigator (Cantani) caused consumptives to inhale powdered cultures of B. termo in the hope that this innocuous organism would destroy the tubercle bacillus. The immense numbers of the putrefactive bacteria inhaled brought about such intense processes of putrefaction in the lungs that the second condition of the patient was worse than the first, and the treatment had to be stopped. It has been shown, however, that it is possible to save the life of an animal infected with tetanus by injecting streptococci, and if we could find a micro-organism which would grow in the mouth and would be sufficiently vigorous to exterminate the acid-producers in the struggle for existence, we might be able in this way to effectually restrict the ravages of decay. There is, however, little hope of being able to find such a micro-organism, for if there were one it probably would have found its way into the human mouth long ago.

As already indicated in my paper it is a question well worth our careful study whether immunity to caries is not the result of antagonism between different kinds of bacteria in the mouth.

Dr. Hart. Dr. Miller, it is the privilege of Dr. Swift and myself to express to you the deep sense of gratitude and appreciation of the Odontological Society and the First District Dental Society of this city. We wish you a safe and pleasant journey home, and whenever you determine to visit this country again, we will receive you, sir, with outstretched arms.

Adjournment.

Wm. B. Dunning, D.D.S.,
Editor N. Y. Odont. Soc.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Anniversary Meeting, December 1905.

The thirty-seventh anniversary meeting of the First District Dental Society of the State of New York was held on Tuesday evening, December 12, 1905, in the amphitheater of the Academy of Medicine, No. 17 West Forty-third street, New York city, the president, Dr. A. L. Swift, in the chair.

The President. I have great pleasure in introducing to you Dr. J. P. Buckley of Chicago, who will read a paper entitled "The Rational Treatment of Putrescent Pulps and Their Sequelæ."

[This paper is printed in full at page 537 of the present issue of the Cosmos.]

Discussion.

Dr. S. A. Hopkins, Boston. I am afraid that my meager knowledge of chemistry does not enable me to appreciate this paper at its proper value; but when a man of Dr. Buckley's experience and erudition puts forth a method of treating a pathological condition, I am certainly willing to give it a place in my treatment of such cases. If no pathological changes have begun outside the tooth in the surrounding tissues, if no anatomical complications arise, and if there be ample time to make the operation thorough, my own experience has been that a pulpless tooth may be treated and filled at one sitting, with every promise of success. When roots are crooked, teeth inaccessible, and the cavities through which we have to treat these teeth are awkward; when pathological conditions ranging from a slight soreness to necrosis and septicemia confront us, I confess that I am willing to cry aloud for help, and I believe Dr. Buckley's paper is going to help me.

Pulpless teeth differ so in their peculiar attributes that no one method will suffice to cover all cases. We must take into consideration the personality of the individual, the idiosyncrasies of temperament, the value of the tooth in mastication, and many other factors. Sometimes I think that the well-nigh obsolete, old-fashioned remedy—extraction—has still a restricted use in treating these cases. I am sure I should not know how to lay down a course of treatment for any given case without seeing the patient and examining the case most carefully; and even then I would be liable to be mistaken!

There is no greater satisfaction to me in dentistry than—when a patient comes in with a swollen face, suffering a great deal of pain—to open into a tooth and hear the sigh of relief that comes when the pus is evacuated and the pressure removed. These cases are comparatively easy to treat.

But reverse the picture. The patient comes in with considerable pain and a severe cellulitis. There is no sign of pus in the tissue outside of the tooth, and no place to lance. The tooth is opened and we find no pus, very little odor, and sometimes a remnant of vitality in one of the canals. From the extensive swelling, the soreness along the periosteum, and from the slowness of the development of the symptoms, we suspect that we have a streptococcus invasion. If Dr. Buckley or anyone else can help me out of this difficulty, I will accord him my everlasting gratitude.

In regard to putrefying pulps, do we know what the products of decomposition really are? The peculiarity of all proteids is that they differ among themselves in their degree of solubility and the products resulting from their decomposition. We cannot predict with certainty what the result of decomposition of a bit of meat, of fish, or human tooth-pulp will be. No one can tell whether the ptomains, putrescin and cadaverin, will be present or not. Moreover, these are frequently inert, and not nearly as dangerous as muscarin, neurin, and others.

I think we do not get them for this reason. The putrefaction of meat and similar substances is brought about chiefly by spore-bearing anaerobic organisms and by derivatives of the coli group and by other bacteria which have not been found in the tooth-pulp, and many of which are rarely seen in the mouth.

Furthermore, decomposed proteid substance is not always poisonous. Putrid meat may be perfectly inert, and meat that is apparently in good condition may be poisonous. Some savage races prefer putrid fish, and most of us prefer game when it is pretty well advanced in decomposition; so that I am inclined to think that we need a little more light on the question of ptomains derived from the tooth-pulp.

There are other ptomains, derived from the body of the bacteria itself, that are known to be quite poisonous. Van de Velde some years ago isolated from the decomposition of the streptococcus pyogenes a substance which would destroy leucocytes. This we now know as leucocidin, and it is capable of destroying a leucocyte cell in two minutes. This ptomain is produced by the staphylococcus pyogenes, both albus and aureus, which are constantly found in the mouth. The product of decomposition of proteid substances depends upon the kind of organism, the amount of oxygen, the amount of moisture, and various other considerations—probably the chemistry of the protoplasmic cell attacked, and the question of immunity and susceptibility, would enter into it also.

I must express my heartfelt thanks to Dr. Buckley for this excellent paper, and can assure him that the method is going to find a very prominent place in my armament in the warfare against putrescent pulps and their sequelæ.

Dr. A. W. HARLAN. Dr. Buckley has presented to you a method of the treatment of putrescent pulps which is entirely original with him, and I am willing and proud to give him the credit of having presented something new in this respect. I have studied the chemistry of this subject, and I hold his paper in my hand now. Although I am not a chemist, and do not pretend to be, there are some things connected with it which I am compelled to notice. Dr. Buckley is here tonight, an essayist for the first time in the city of New York, with one of the largest and most critical audiences before which any man could appear, and has presented something which very few are able to follow from beginning to end.

Dr. Buckley says in effect that if a devitalized pulp becomes the seat of putrefactive changes something or other will happen, if the putrefaction is allowed to run its course undisturbed. The tissues beyond the apex of the root of that tooth will become poisoned in consequence of the decomposition of the substance of the pulp. He shows the things that take place; we have hydrogen sulfid (H_2S), ammonia (NH_3), cadaverin, putrescin, and neuridin. He says, "I will take formaldehyd and cresol, which was formerly tricresol, and unite them in equal parts, and after I have applied the rubber dam and washed the teeth, I will bore into that tooth and apply this formula." This formula, according to Dr. Buckley, must destroy H_2S, NH_3, and possibly PH_3; also neuridin, cadaverin, putrescin, etc., and we have as a result urotropin, and further, methyl alcohol.

Dr. Buckley knows, and I know, and others know, that urotropin is a substance that is liable to a re-decomposition, especially after three, four, or five days. What results from the decomposition of urotropin? We get formaldehyd again. If NH_3 be decomposed in the presence of methyl alcohol, a re-decomposition is liable to occur with cresol as one of the end-products, and cresol is one of the components of this prescription that is intended to produce innocuousness of the products of a putrescent pulp. I have no fault to find and rather agree with that. I would say to Dr. Buckley, because we have decomposition and re-decomposition, that he has presented something absolutely valuable to us—not wholly on account of the reasons in his paper, but on account of the decomposition which takes place in spite of us when we place substances within a tooth. The whole chemistry of pulp-decomposition has not been studied out by anyone. I have taken the trouble recently to reread the work of Holleman, who is the best organic chemist up to the present time. After reading Dr. Buckley's paper, I consider that the latter comes very close to the solution of this problem, on which I congratulate him. I do not know whether or not you have read the chapter on albumins in Dr. Holleman's work.

I do not care anything about the notes you make on paper, because empirics though we be in some respects, sometimes our clinical experience disproves our theories, and Dr. Buckley's presentation—at Albany last May, and in other places—of this subject of the union of formaldehyd and cresol seems to prove clinically that his position is correct; and so there may be some mistake in Holleman's conclusions with reference to the reaction that takes place in the decomposition of animal tissue. Therefore I leave him at that point.

I am unable now in looking at this subject—and I have spent one hundred hours on it within the last three or four weeks—to say that I wholly coincide with Dr. Buckley's theory, because there may be some weak place in it that I have not been able to discover. Dr. Buckley himself will not say that hydrogen sulfid, ammonia, cadaverin, and putrescin are all end-products, because that phase of the subject has not been pursued to its ultimate end; nor will he be able to say that the union of those two agents will be able to convert all of those substances into a liquid or solid, and that all trouble will be averted.

As to the putrescent pulp, he says that on the second visit he has at the suggestion of Dr. Rhein used 1:500 solution of mercuric chlorid in hydrogen dioxid. In the first part of his paper he says, "I believe that polypharmacy is not a good thing, but that monopharmacy is a better thing." In this paper—which I know by heart, having read it over and over again—there are some of the best forms of polypharmacy that you ever saw in your life. You have formaldehyd, cresol, alcohol, mercuric chlorid, the compound syrup of sarsaparilla, acetanilid, and various other drugs; and when you get through with the treatment of the putrescent pulp, the pharmacopeia looks rather bare, and there are not many flags flying at the top of it. I am not saying this with any disrespect to Dr. Buckley, because he knows it is a subject that I know a little about myself, and I have stood in this very room before other societies and talked about it. As early as 1882 I studied it, so I know something about the facts, because it was my privilege to present a paper before the Chicago Dental Society on H_2O_2, the first paper on that subject that was ever read in the United States. Dr. Black, in discussing the matter with me, said, "Why not combine 1:1000 solution of mercuric chlorid with hydrogen dioxid?" and I said, "That is a good idea; but why not dissolve the chlorid in the dioxid itself?" He then answered, "Perhaps that would be better." That is a question I have not pushed, and I am not making any claims about it; but when Dr. Buckley introduces at 1:500 solution of mercuric chlorid as his second dressing, that is what destroys the infection—not the formaldehyd and not the cresol. That is what I call polypharmacy.

Look at this subject from the standpoint that most of you do: A pulp dies and the patient calls on us; perhaps the tooth is sore—at least the pulp is bad-smelling. You open up the root-canal and say, What shall I do? How can I disinfect that? I have not the slightest objection to Dr. Buckley's presenting formaldehyd and cresol as the disinfectants, because there is no reason why they should not do so in the presence of water. If one uses a substance that will not only destroy the mephitic gases, but also the cadaveric poisons and others, then one has done all that could be reasonably expected. Dr. Buckley has presented a new thought in this: that when he presents equal parts of formalin and cresol without water and introduces that into a tooth, he says, "Here is a gas H_2S; here is a gas NH_3; a liquid and a solid are produced and the gases destroyed." He directs us to pack some soft cement without pressure, seal it hermetically, and the result will be excellent.

With reference to the drug aspect of the question, there are other substances that one can seal into a tooth, but very few of them theoretically will reduce two gases, one to a solid and the other to a liquid. Therefore I say this is well worth one's trial. I do not agree with him with reference to the total obliteration of all the poisonous products evolved during the decomposition of the pulp. He did not say that this was the *ipse dixit* of the profession—that there was nothing more to be learned. He knows that some of the poisons are so elusive, so easily soluble, and escape so freely, that it is impossible that a single, a double, or a hydra-headed prescription will hit all of them, and I am glad he left that out, because we have been discussing this putrescent-pulp question for many, many years. I doubt today if there are one thousand practitioners out of the thirty-five thousand in the United States, who are practicing what we call advanced methods for the destruction of the ptomains and gases that form during the decomposition of the pulp. Most of them are still using carbolic acid, zinc chlorid, creasote, and iodin, forgetting that the $ZnCl_2$ does not kill anything, that a full-grown microbe can live in a saturated solution of it, and can be hatched in it and live in its dregs.

I say to you, whatever you use to produce asepsis, whether formalin and cresol, copper, or any other substance, that you must isolate teeth, that you must sterilize the teeth; you must place something in contact with the decomposed products within a tooth that will have the best opportunity to destroy them, and I believe Dr. Buckley has come nearer to producing something with formaldehyd and cresol than any of us in all the years we have been practicing.

Dr. RHEIN. It is not my purpose to enter into any argumentative discussion, nor do I propose to make what I have to say a medium of personal combat with any of the gentlemen who have preceded me. My entire object in the few words I have to say on this subject is, if possible, to aid the efforts which Dr. Buckley has been making for the past few years in taking this subject, as he so forcibly said, from the realm of empiricism into rational practice. It is something that has been very dear to my heart for a great many years, and while it may be a curious coincidence that Dr. Harlan commenced the use of this polypharmacal preparation about the same time in Chicago that I did in New York, I am perfectly willing to relegate all the honors of the prescription to Dr. Harlan. While I consider the combination of $HgCl_2$ and H_2O_2 a very valuable adjunct from a therapeutic point of view, to me it is a matter of perfect indifference on whom is bestowed the honor of introducing the preparation. Up to the present time I had never heard Dr. Harlan make any reference to his use of the remedy, but I am pleased to waive all claims to him, so as to avoid any further discussion on this point.

I believe the large audience tonight, and the deep attention it has given this subject, as well as the deep attention given to Dr. Buckley in Albany last May, is because you as a profession are alive to the fact that the treatment of root-canals and of the surrounding pathological conditions has not been properly carried on in the dentistry of the past. I do not propose to befuddle your minds with any biological or pathological or chemical formulæ. I want to strike right at the heart of this subject, and in doing that I am only adding to what Dr. Buckley has advocated in all the lines of work he has presented. There is one thing needful in handling devitalized pulps, and that is simply the removal from the canals of every particle of organic matter to the very end, and as far as possible into the tubuli of the teeth. Any way that this can be done, and done thoroughly, without carrying infection into the periapical space is going to make you succeed in saving the tooth, I do not care what the method may be. Countless methods can be introduced for this purpose and be successful.

Dr. Buckley's paper at Albany on this subject, as he said in the closing remarks in his paper tonight, was very much misinterpreted, not only by the gentlemen then present but by those who have read the paper since. I know from personal investigation that the facts he stated in his paper are true. Last month I had the pleasure of addressing the Fifth District Dental Society at Rome, N. Y., at its semi-annual meeting. In the afternoon a paper was read on this subject by a gentleman who imagined he was following out Dr. Buckley's views as presented at Albany, and he gave the history of quite a number of cases which he had treated, in which over fifty per cent. had been decided failures. In discussing the subject at that meeting I told the gentleman that Dr. Buckley's method was not a failure. He simply had done what Dr. Buckley deprecated tonight; he had used the combination of cresol and formaldehyd in two classes of cases where it was distinctly contra-indicated. In the first class he had used it in cases where there was some living pulp tissue left, and where it was bound to make trouble. The second class was where he had used it in cases of periapical infection tending toward an abscess, leaving the application in longer than twenty-four hours—in fact, some days. As a result in the latter case, as Dr. Harlan well expressed, while the urotropin was originally formed and had decomposed, all of the purulent condition in the tooth—the continued drainage of pus from the periapical space into the tooth—in its turn overcame the action of the urotropin, and the original condition of affairs was reproduced. This gentleman went away from Albany with the idea that Dr. Buckley was giving a specific line of treatment in this formula for all cases of root-disturbance, and that is where many men have made a mistake. It is important to emphasize this one point, so that the profession should make no more mistakes of that nature, and therefore there need be no apology for harping on this one theme.

I have given Dr. Buckley's formula a very careful trial since last May in about six cases where there was no question of there being a purely purulent condition of the pulp-contents. Such a case as Dr. Hopkins described, where one drills into the tooth and the patient is afforded that inestimable relief for which he is willing to give up half his fortune at the moment, and forgets about it afterward!—that is the kind of case to which this formula is especially applicable. I find it so in my practice for the reason that these cases come into our office as emergency cases. We do not have any appointment with them; they are suffering perhaps with an oncoming abscess. We have not the time to remove the contents of the root-canals under such prevailing conditions because of the pressure of time, and for such cases we have in Dr. Buckley's formula a remedy which requires only a very few minutes of our time—the application of the rubber dam, the sterilizing of the parts, the drilling into the tooth, and the introduction of this medicament, sealing it up and dismissing the patient until such time as we can properly remove every particle of organic tissue from the root-canals. This to me is the reason why the value of the formula which the essayist has presented tonight is very great.

I cannot agree entirely with some of the practical points in the paper. As I said before, and as all of the speakers who have discussed the question prior to me have said, the individual characteristics not only of the patient but of the man with the hoe, or the man with the gun, have a great deal to do in the treatment of each case. I cannot agree with the view of the essayist that this is a better treatment—if I understood him correctly—than the sodium dioxid treatment would be, or any treatment for which sufficient time could be taken to aseptically remove every particle of the root-canal contents.

I am very glad, however, to emphasize my hearty concurrence with the view of the essayist that where there has been infection in the periapical space, whether there be a fistula or not, after the treatment of that infected tissue has been completed and the root-canals have been thoroughly cleansed, is the psychological moment when the end of that root or roots should be sealed, not waiting for any weeping of serous matter, whether it be infected or not. If there has been any mistake in the treatment of the periapical space—if it has been incompletely treated—the future treatment, if it is to be radical and thorough, must of necessity be through the alveolar process and not from within the root; consequently there is nothing to be gained by delay, but on the contrary, a great deal to be lost.

It is impossible to discuss this matter as I want to from a practical standpoint without advocating the technique which I presented in a practical way at a clinic yesterday before this society, and which I regret all of you were not able to see. I specially chose a case where there was a chronic abscess of six months' standing, in order to demonstrate the feasibility of curing such an infected area without the use of any drug treatment in the ordinary acceptation of the word, but purely by means of electrolytic treatment. I am sure that no one who saw that case yesterday and saw the patient again today could help realizing the thorough success which resulted from this simple treatment.

I do not intend to take up your time this evening by going into the details of the technique of my clinic. It is completely described in the October issue of the DENTAL COSMOS (pages 1196-1201), and any of you can refer to it. I can only say that at the clinic yesterday I went over the entire detail of the method there presented, and the advantage that I claim for that technique is that, given the time necessary, no error of judgment can be made by a dentist in using it in the wrong class of cases. It is applicable to any form of case or condition found in a root-canal. I know at the present time of no condition where there is a dead or partly dead pulp, or where a living pulp is to be extirpated, that this technique is not available, and where, if its use be properly carried out and every particle of organic contents be removed, it can fail to result in absolute success. I do not bring it forth in contradiction to what Dr. Buckley has presented to you, because it is not in opposition. He presents something that we want to use in as little time as possible, and there is no clash between the two things in any sense at all.

This morning I took an X ray of the case I clinicked on yesterday, and any of the gentlemen who are interested and saw the operation can see the evidence of the fistulous tract. Immediately after the electrolytic treatment, which I used in the periapical space for seven minutes, employing about three milliamperes of current, decomposing chemically pure zinc, the root was filled, and the root-filling is fully shown in the picture.

Concerning the benefit of cresol and formaldehyd, and its accomplishing painlessly the transformation of all these end-products until they can be properly removed, there can be absolutely no question in the mind of anyone who has given the preparation a fair trial.

President SWIFT. At the last moment Dr. Kirk found it impossible to be present. He has sent his written discussion, however, which Dr. Dunning will read:

Dr. E. C. KIRK, Philadelphia, Pa. I desire to fulfill the promise I made to Dr. Dunning, the chairman of your executive committee, and further, to set myself straight with the essayist and his audience by recording my views upon the ideas and suggestions set forth in his paper, and inasmuch as I am unable to be present I take the liberty of sending this statement to be used in discussion in lieu of a verbal communication.

I am in hearty accord with the view expressed by the essayist that the therapeutic treatment of pathological phenomena should be in accordance with the conditions which they present in each case. The adaptation of means to ends should be the law of therapeutics just as certainly as it should be in mechanics or in organic evolution. I hail with satisfaction the tendency of educational methods toward a practical realization of this ideal in therapy as evidenced by the emphasis now placed upon laboratory methods of instruction in biology, histology, physiology, physiological chemistry, pathology, pharmacodynamics, and in fact in all branches of medical science, and in consequence of this, the substitution of rationalism for the empirical method in the treatment of disease conditions everywhere.

It is because of my sympathy with just that state of affairs —a sympathy which I am quite sure is also shared in full measure by the essayist of the evening—that I feel justified in discussing with the utmost freedom certain points and suggestions contained in his paper, for, as I apprehend it, the truth and nothing but the truth is the scientific ideal, and the scientific spirit must therefore be the spirit of self-abnegation at any cost provided the truth shall prevail.

I am in full accord with the general scheme of pulp-decomposition set forth by the essayist. I am not aware that he or anyone else has by actual experimental investigation of the pulp tissues themselves determined the facts concerning their decomposition to be as he states them; but we do know that the pulp contains histological elements having presumably the same chemical composition as other tissues that have been so investigated, and therefore Dr. Buckley's deductions by analogy rest upon a logical foundation. This same idea has, however, been before the dental profession in concrete form since 1897, when it was promulgated by the late Prof. H. H. Burchard in the chapter on "Gangrene of the Pulp," written by him in the first edition of the "American Text-book of Operative Dentistry," where he gives a diagrammatic representation of the progressive decomposition of the pulp tissues through the agency of micro-organisms, adapting the views of Ziegler on proteid decomposition in general to the particular case of the dental pulp. A republication of the same exhibit occurs in Dr. Burchard's "Dental Pathology, Therapeutics, and Pharmacology," at page 384, and has been reprinted in the second edition of the same work edited by Inglis, at page 447.

I do not agree with the essayist in his expressed belief that the pressure arising from confined gases of pulp-decomposition "forces poisonous ptomains through the apical foramen, causing septic pericementitis, and in many cases, alveolar abscess," for the reason that the ptomains are solid or semi-solid bodies, and there is no evidence to show that they are soluble or miscible in carbon dioxid. nitrogen, ammonia as gas, or hydrogen sulfid. Therefore the factor of relative specific gravity would tend to confine abscess production to the teeth of the lower denture, if the pressure idea of the essayist were the correct explanation of the modus of infection of the periapical tissues as a general thing. My own belief is that the periapical tissues become infected by those pathogenic bacteria which originally infected the pulp, and that the modus of infection is simply by continuity of these with the tissues of the pulp, producing all the phenomena of suppuration, tissue death, and decomposition, with the formation of the usual end-products.

The acute manifestations due to pressure supervene when exit for these decomposition products is cut off, and, in my opinion, when acute symptoms supervene in consequence of gaseous pressure in the pulp-chamber, the periapical tissues have already, and indeed long before, been invaded by pathogenic bacteria —in other words, are already infected. I cannot admit, with my present understanding of the phenomena involved, that the acute inflammatory outbreak has any other origin than bacterial infection, for the reason that mere mechanical injury to the tissues will not of itself cause septic inflammation.

Let me now consider the therapeutic aspect of the matter as presented by the essayist; and in the first place I wish to say, and to say emphatically, that I have not the slightest doubt that the combination of formol-cresol which he advocates will accomplish all that he claims for it. I have not experimented with it, for I do not need to test its virtues practically; first, because I do not need to establish its value. I take the essayist's word for its efficacy, as it is in accord with the known effects of these two agents when used separately, and there is absolutely no good reason why they should not act as well when combined. When I know by experience that one horse will pull a given load, it is superfluous for me to try an experiment to find out whether a pair of horses will also pull the same load; or for me to go farther and endeavor to find out whether they will also pull it when hitched abreast, or when hitched tandem.

The second reason why I have not used it is because I can and do obtain satisfactory results by other methods, which to me seem to involve as large a degree of rationalism as the method advocated by the essayist.

Dr. Buckley explains his object in selecting drugs for the treatment of the conditions under consideration to be—"to select those which will unite chemically with the intermediate and end-products of decomposition, converting them into odorless and non-infectious compounds, as well as to destroy germ life." He also makes provision for the radical disposition of the fats and gaseous end-products of decomposition.

It is because he has found certain combinations of formol and cresol to satisfactorily accomplish these ends, that he advocates their use, as I understand it, to the exclusion of other drugs; and as I still further understand him, with the implication that the method which he advocates is a "rational" one, while, *per contra,* most other methods are not. If I am wrong in this estimate of the essayist's position, I shall be glad to have him correct my misunderstanding.

Dr. Buckley gives the method by which he believes formaldehyd acts in rendering innocuous the products of proteid decomposition; and, from his showing, formaldehyd is sufficient for that purpose in all respects but one, namely, that of disposing of the fatty compounds; to get rid of these he uses cresol, the only other use of which is to act as a diluent of the formalin. It is in regard to his use of cresol as an adjuvant to formalin that I have raised a question of rationalism as to his procedure, concerning which the essayist says, "It is manifestly unjust to the profession and unfair to himself, for me to question the rationalism of the method without having tried it."

This is certainly a severe indictment, and as I feel sure that it arises from a misconception of my meaning, I desire to explain to the essayist that I consider the factor of rationalism, in this case, to be purely a matter of intellectual or mental conception of the nature of the conditions to be met with, and the intelligent application of means to meet those ends. The question of whether his method is practically successful or not, does not necessarily involve the element of rationalism at all, for it may be applied with equal success by the man who uses it empirically, as well as by the man who uses it rationally.

A man may start a conflagration with a lighted match with equally momentous consequences, whether he be an expert scientist having an intimate knowledge of the chemistry of combustion, or whether he have no more knowledge than is comprised in the empirical fact that a lighted match will start a blaze. Rationalism is therefore not a factor of the phenomenon, but of one's mental attitude toward the phenomenon. I feel that I may therefore rationally question the rationalism of the procedure without in the slightest degree questioning its efficacy. The reason, then, why I question the rationalism of the combination of cresol and formalin is that from the known properties of both therapeutic agents I fail to see on rational grounds, what advantage is gained by the addition of cresol to formalin, which latter drug will of itself do all that is claimed for the mixture, with the exception of disposing "of the fatty substances" according to the evidence submitted by the essayist himself.

I do not know just what importance the essayist attaches to these fatty substances as causes of pericemental trouble, but on general principles I should regard them as of minor grade. There are very many questions of a chemical character that arise in connection with the problem of pulp-decomposition which need to be studied and taken into account before we can arrive at a truly scientific conclusion as to the rationale of the entire process. For example, the essayist calls attention to the fact that ammonia is one of the end-products, and it is not outside the bounds of rational speculation to suggest that in the presence of ammonia these fatty substances are converted into ammoniacal soaps and are thus rendered soluble, in which case the addition of cresol to formol for the specific purpose of disposing of the fatty substances would be unnecessary.

I do not wish to be thought hypercritical in this matter, but what I do desire is to avoid making the mistake of attributing to a combination of drugs a peculiar and desirable therapeutic property which is clearly attributable to one of the ingredients of the combination, and this it seems to me is the case in the formol-cresol combination. All that the essayist has claimed for the combination in a therapeutic way has certainly been obtained by myself and many others by the use of formol alone in proper dilutions, so that from practical observation I am forced to the conclusion that the addition of cresol is not needed, either as a diluent or to dispose of the fatty substances, which latter are either disposed of by the formol, or are a negligible factor.

The importance of this whole question rests, to my mind, in the desirability of relieving our therapeutics of all elements of mystery, which we can best do by reducing our medication to terms of the greatest simplicity, for by this plan we avoid confusion, and do not make the mistake of attributing to a mixture properties belonging to one of its ingredients.

I note that in certain cases the essayist precedes the application of his "combination" by a treatment of "mercury-hydrogen dioxid." I fail to see why this should be necessary in view of the claim which he makes for the antiseptic properties of his "combination."

Do we not on the whole lack faith in the properties of the antiseptics we use, or is it a lack of knowledge? Why is it necessary to treat successively with sublimate, hydrogen dioxid, and formalin and cresol, any one of which, if it can be made to reach the part, is as destructive of organic life and organic compounds as a red heat would be. I would make the plea for a more thorough understanding of the properties of these agents, and greater simplicity in their application.

The suggestions for constitutional treatment given by the essayist I heartily approve of, and these, with the exception of potassium iodid, I have systematically used for years when indicated in cases of dento-alveolar abscess. The saline carthartic is a generally recognized therapeutic agent in all cases where there is found to be an elevation of temperature from absorption of toxins. Quinin is not only valuable as an antiseptic, but as a specific germicide acting through the circulation. Acetanilid as a general sedative is also of great value in controlling pain and in reducing arterial pressure. I congratulate the essayist upon the well-ordered and, let me say, rational system of treatment which he recommends. It is because I admire and approve his method that I dislike to see it marred by even a small defect in reasoning, which was and is the only point for criticism in it from my standpoint, and which I fear he has taken more to heart than I had intended, or than the thing itself warranted.

Dr. JOHN E. NYMAN, Chicago, Ill. There is no question that we obtain the best results when we use the simplest methods. The more we complicate our methods, the more failures we have. The chemist has come to play a very important part in the rational consideration of pathological conditions and the measures to combat them. There never was a satisfactory explanation of the phenomena of immunity and susceptibility, or of the development of antitoxins in the system—either naturally in the course of human events, or the artificial antitoxins developed outside the body and afterwards surgically introduced into it, resulting in an acquired immunity—until Dr. Paul Ehrlich, a chemist, promulgated his "side-chain theory." So it has remained for a gentleman whose previous years were largely given over to chemistry, both theoretical and practical, to formulate measures which seem to be rational in the treatment of putrescent conditions found in the teeth and jaws. My remarks will be from the standpoint of clinical experience rather than from the theoretical knowledge of chemistry. When a patient comes to me with a badly swollen face, a very sore tooth—every evidence of intense suffering, and of developing and accumulated pus—I have been very loath to subject him to the additional suffering involved in adjusting the rubber dam and the use of ligatures and clamps. I have been content, and have felt in my heart that I was giving him good and logical treatment when I merely opened that abscess and allowed it to drain, at the same time prescribing for him as strong an antiseptic as one dare use in the mouth, instructing him to use it every hour in the endeavor to maintain an aseptic condition in the oral cavity to prevent multiple infection while the abscess drained. Almost invariably there has been immediate relief, and the soreness has disappeared in a short time. I have never yet seen multiple infection after this treatment. At a subsequent sitting I have been able to open up that tooth more thoroughly, under better surgical environment. I have been able to adjust the rubber dam, and been able to use the measures Dr. Buckley suggested with very satisfactory results.

I desire to mention two other remedies called to my notice by Dr. MaWhinney of Chicago—a paste of paraform and tricresol in cases which are not in an acute stage, but which upon examination prove to contain an unexposed pulp in an advanced state of decomposition. The application of a paste of paraform (prepared by Schering & Co.) and tricresol in the neighborhood of the pulp, without directly exposing the pulp, results in a slow development of formaldehyd gas, which will penetrate the septum of dentin and disinfect the canal and its contents. I have had much better results than if I had attempted to open the pulp-canal, for with all the care one may endeavor to use, he so frequently causes, involuntarily, pressure which gives subsequent trouble.

In place of such an agent as mercuric I had attempted to open the pulp-canal, I have been employing a ten per cent. solution of chinosol which is far more effective, is not irritating to the tissues, and possesses the additional quality of being soluble in the fluids of the tissues in any proportion. I have had more successful results in this way than by using any of the coagulants to start with. I use the coagulants after the chinosol solution, and then I only use them—merely for the mechanical effect—for the sloughing away of this tissue which contains so many of the microbes and the end-products.

Dr. Buckley is wisely instilling into the minds of the profession the necessity for counteracting these chemical poisons. If a gang of college boys, in a spirit of mischief, were filling this room with chlorin gas, it would not do us, the victims, much good to have policemen outside simply arrest the boys who were using the chlorin gas, and force them to desist, without doing something to relieve us from the toxic effects of the gas. Thus it does not seem that we are giving the best and most scientific treatment at the present day, when we devote our time alone to the destruction of the bacteria. We must not only destroy the bacteria, but also counteract the chemical poisons which they develop.

I am proud of my fellow townsman, and am glad to witness this personal triumph on his part. You have received him most cordially and I know he very well merits it.

Dr. S. G. Perry. Mr. President, you are very kind to call upon me, but you are not very wise, for I am not a chemist, and why should I discuss a question of which I know nothing? I am made a little dizzy, too, by this Baconian essay of Dr. Kirk's. He would have made a good lawyer, because he presented his case with many words well placed, and yet in a lawyer's convincing way. I am not sure whether we are any wiser after the reading of his communication than before, because we are not chemists, and I say this with the utmost kindness toward Dr. Kirk. There were also some new and very large words used by Dr. Harlan and the essayist. When I get time I will look them up and see what they mean—if I can find them in any dictionary.

I might say a word from the clinical standpoint, and that is, that when I find a tooth about which trouble is impending, I drill a hole into it with as small and sharp a bur as possible, and tell the patient to go home and wait. I entirely agree with the essayist that it is extremely wise to do nothing to force débris or gases through the end of the root, as I think it eminently wise to be very careful and wait a little—and am very glad to say that I have felt very grateful to my dear friend Dr. Northrop for having suggested this to me many years ago; because, as he will tell you, the part of wisdom is to be very careful and to wait a little after opening a tooth where there is impending trouble. That has been my practice in most cases. I go very slowly at first. After the trouble has subsided, I work a little more freely, and remove the contents of the canal—I do not know what its new name is—and try to be very careful to push nothing up toward the end of the root of the tooth. I use such remedies as I have found would answer, some indifferently, some fairly well, some perhaps remarkably well—the remedies being for the most part germicides—not selected chemically with a view of affecting the gases so much; and yet tonight I am impressed with the fact that the gases may play a greater part than we have been inclined to think.

In reference to this new method which Dr. Buckley brought before the profession last spring—I have used it faithfully, and I must say candidly I am very favorably impressed with its use. It is not strange that in the early days of our profession we should have become dizzy in our delight in working on the mechanical side of our profession—perfecting ourselves in the restoration of the natural teeth, and all that pertains to the beautiful art of dentistry; neither is it strange that attention should be given late in the day to the matter of the chemical conditions we have to meet in the mouth.

I think we are to be congratulated that at last we are beginning to appreciate the need of a wider and more accurate knowledge of the chemistry of the mouth, and I take great pleasure in praising the gentleman who has tonight read such an eminently scientific paper, and who gave us one of the same kind last spring at Albany. I think it is a very helpful thing indeed that we have men who can give the time, and who are fitted by previous education and environment to give the attention necessary for this work; because dentists who work hard and are obliged to pay rent and meet the expenses of their families have not the time, and in this country of ours, where things progress so rapidly, it is not expected that men should take the time to fit themselves for these special departments. We should be eminently happy at having a man like Dr. Buckley, who has shown by his paper tonight that he is well fitted to take up this work, carry it forward, and give us the results of his scientific and accurate knowledge, which is of the utmost importance to us. I have nothing but praise for the paper.

Dr. JOHN I. HART. I think it has been well said tonight that this subject has been before the profession for a great many years, and yet Dr. Buckley must feel ample excuse for taking it up in that the methods of treatment are still so diverse. Those who are familiar with the treatment as shown in our literature, find it ranges from a minute opening with a drill into an infected tooth, up to the sterilizing of the tooth, the removal of the pulp, and the complete filling of the canal. With such divergence presenting itself to the profession, it is high time the matter be taken up by a man of Dr. Buckley's ability and in the way he has presented it. These teeth under consideration present themselves with a certain amount of periapical irritation, sometimes infection, and if we attempt any radical treatment we do so at great inconvenience to the patient.

Dr. Buckley suggested this method some months prior to the paper he read at Albany, and I tried the method at the same time. It has been a boon to me to make an opening into the tooth, place the formalin and tricresol in the pulp-chamber without danger of forcing the infected contents of the root-canal through to the periapical space; seal the medicament in the cavity with no subsequent irritation, and at the next sitting remove the root-canal contents. I can only express my deep sense of gratitude to Dr. Buckley for the method he has suggested, not only tonight, but at Albany, and even prior to that time. I think any member of the profession who will follow the principles he has enunciated will find it a boon.

President SWIFT. Before asking the essayist to close the discussion, I cannot resist the temptation to say that since last May I have repeatedly tried this method, and in no instance has it failed. I want to express my debt of gratitude to the essayist also.

Dr. BUCKLEY. I feel that the best thing I can say would be to thank you and sit down; but there are a few statements that have been made tonight that it seems to me someone ought to answer, and perhaps it would be as well for me to make that attempt as anybody.

Dr. Hopkins in his remarks said that the intermediate products of pulp-decomposition depended on the kind of micro-organisms present, the amount of moisture and oxygen, etc., for the proper working of the organism. That is correct. I am unable to state definitely that the ptomains, putrescin, cadaverin, and neuridin, are formed in all root-canals the pulps of which have undergone the process of decomposition. I do not know that the oxygen has much to do with it, but it does depend upon the kind of germ working in the dead tissue.

Dr. Hopkins also questioned the poisonous properties of putrescin and cadaverin, saying they were not as poisonous as muscarin and neurin. Vaughan and Novy have proved conclusively that two of these three ptomains I mentioned, putrescin and cadaverin, will produce, when isolated from all other organisms, inflammation and suppuration. Neuridin is absolutely non-poisonous when isolated from the other two, which are poisonous. Neuridin, therefore, is only poisonous in that it is always associated with putrescin and cadaverin. If they are forced though the end of the root, as Dr. Perry says, there is something there which he could not name, but which we do not want to force through—for if we do, trouble will surely follow.

Dr. Harlan, my old friend and teacher, has carried this one step farther. Dr. Kirk questions the rationalism of the method. The only reason I called it a rational method was because I felt I knew what took place—to an extent at least—when I sealed these drugs within the tooth. Dr. Harlan has carried it one step farther in that he believes that the substances which were formed by the first reaction are subsequently decomposed. I know that you can decompose urotropin and get formaldehyd back again, under certain conditions. Urotropin is given in medicine for the purpose of disinfecting the urinary tract, because when it comes in contact with the urine, unless it is alkaline, it is broken up into formaldehyd and other substances which disinfect the tract. I do not think the conditions in a root-canal are such as to again cause the formation of formaldehyd. It is a good theory, but I do not think it can be carried out in practice.

Dr. Harlan also questioned my polypharmacy in these prescriptions. There is not a prescription exhibited here but what is an example of monopharmacy. The mistake he made is that he considered them all together. There are many drugs mentioned, it is true, and the pharmacopeia, perhaps, would look sick after we got through with all I mentioned. Monopharmacy means that when you have a certain condition to treat, you select one drug that will counteract that condition. Here we have one drug for a certain purpose in each prescription. If there is any other preparation it is put in as a vehicle or a diluent for the drug selected to counteract the condition. One thing I was proud of was that I thought the remedy was simple. Dr. Kirk further criticizes it because it is too complicated—because I put in cresol when he says formaldehyd would do the work alone. This remedy would have been more appreciated, I do not say by the ladies and gentlemen before me tonight, but by the laymen of the profession, if I had added four or five more ingredients than I did. If I had taken formalin and cresol and one drop of oil of cloves, and four or five drops of five or six more remedies, and made it a complicated thing, it would have been appreciated much more by certain members of the profession. Cresol is added to this remedy for a purpose other than a vehicle with which to dilute formalin. There are fats resulting from the decomposition of the pulp, and I know that in pharmacy, lysol, which is a good antiseptic, is produced by acting upon fats with cresol, subsequently saponifying the mixture with alcohol. That is one reason why I selected cresol as the vehicle over creasote, phenol, etc., which might have been used. You cannot doubt, today, as a result of investigation along chemical lines, the presence of fats or fatty acids in putrescent root-canals. Proteid material constitutes the greater part of animal tissue. Knowing that outside of the tooth we can act on the fats with cresol and change them into lysol, I selected this agent, thinking it would act on the fats to an advantage, and as a result we would have lysol, or something analogous to it, produced. The hydrogen sulfid, I believe, is converted by formaldehyd into methyl alcohol. There may be some question about this; I do not know that you can find it in any chemistry. I know you can balance the equation, and I believe this reaction takes place. I know you can change the ammonia and formaldehyd—two gases coming in contact with each other—into urotropin, and I believe you can take cresol and have it act on the fats, and you get something resembling lysol.

Dr. Kirk says that it is unnecessary to use Dr. Rhein's solution, so called. He is the only man I ever heard of who is afraid of over-sterilizing the dentin. He does not believe in using a cannon and then a Gatling gun. The first remedy is the cannon, and then I use the Gatling gun according to him. Now, when I have sealed the remedy within the putrescent root-canal at the subsequent sitting, by means of hydrogen dioxid, I test for putrescent material. If there is any effervescence I know the remedy has not destroyed all the infectious material; but in nine times out of ten, if you test subsequently the contents of that root-canal with hydrogen dioxid, no effervescence will result. I have used the dioxid solution because I believed it was a good thing. I believe the mercuric chlorid which was in the solution would do no harm, if it did do no good, and I believe it is a good thing to have there, and I do not believe it is irrational to use it.

Dr. Rhein has this matter summed up correctly when he says the main thing is to completely destroy and remove all the organic tissue. I do not care about the method, whether it is called my method, or the Schreier method modified, or the sodium dioxid method advocated by Dr. Kirk, or any other method as long as one completely destroys, or removes, changes into innocuous substances, or better still antiseptic substances, the contents of the putrescent canal and the tubuli.

A method is only a means, a way, a process, by which ideals set up are realized. So I do not care about the way, the means, or the process by which you accomplish your ideals. Ideal results are what we should strive for in treating any condition; the way it is accomplished is a minor consideration—providing, of course, the comfort of the patient is not neglected.

Dr. Wm. B. Dunning. I am sure the entire profession is indebted to Dr. Buckley for his work in this direction, and I move a hearty vote of thanks be extended to him by the society for his most instructive paper.

The motion was carried by a rising vote.

Dr. Nash. It seems fitting at this time that the clinicians who have loaned their aid to giving us such a successful program yesterday and today should receive the thanks of this society. I therefore move that the thanks of the society be likewise extended to the clinicians.

The motion was carried by a rising vote.

The meeting then adjourned to the banquet hall where a collation was served.

B. C. Nash, *Secretary.*

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

(Continued from page 493.)

Second Day—Morning Session.

The subject of Dr. Simpson's paper was passed, and the next order of business was a paper by Dr. L. C. Taylor, Hartford, Conn., on "Some of the Responsibilities of a Dental Practitioner."

After the reading of Dr. Taylor's paper motion was made and carried to adjourn until the Friday night session.

Second Day—*Evening Session.*

The meeting was called to order by Dr. H. E. Kelsey, Baltimore, first vice-president, in the absence of the president, at 8.30 o'clock Friday evening.

The first order of business was the reading of a paper by Dr. R. O. Sadler, Baltimore, on "Abscessed Incisors: Treatment."

The subject of Dr. Sadler's paper was passed, and the next order of business as announced by the president was the reading of a paper by Dr. S. Freeman, New York, N. Y., on "The Use of Compressed

Air in Operative Dentistry," of which an abstract here follows:

THE USE OF COMPRESSED AIR IN OPERATIVE DENTISTRY.

As there has been considerable interest manifested in the use of compressed air in operative dentistry it does not seem amiss for me to again read a paper on this subject which I first presented to the American Dental Association in 1895.

Air may be compressed by means of a pump which sucks in the air and forces it through a pipe to a reservoir, but as it is necessary for our purpose to have a continuous and voluminous current, I would not advise the use of a hand pump or small cylinder, as in employing them it will be found that both the air and operator become quickly exhausted. I would therefore recommend that which is known as the Champion beer pump, or the compound pump of the same manufacture, for I find them both the simplest in construction as well as the most satisfactory air-compressors on the market today. Before placing the pump in the dental office, the number of pounds of water pressure should be ascertained; if, as in my office, only twenty-five pounds are available, the Champion pump, contrary to the claim of the manufacturers, will not furnish the same amount of air pressure, as I have discovered a loss of a few pounds; such being the case, the compound pump (although a few pounds of pressure is also lost) is preferable, as it is frequently necessary to have the air under a pressure of forty to fifty pounds to the square inch.

This pump is connected with the reservoir, which is a tank containing eighteen or more gallons of air tested to one hundred and fifty pounds' pressure to the square inch; from this runs a quarter-inch block-tin pipe which branches to my laboratory and operating room; to this I have attached two gages, the first to show the number of pounds of air in the tank; the second, connected after the regulator, to ascertain the amount of air pressure to be employed in the operations. The regulator is nothing more than a screw valve which as the screw is loosened closes the valve, and *vice versa.*

To the gage is connected a distributing pipe with as many cocks as one may desire for attaching the rubber tubes and cut-offs. The tubes should be of heavy rubber, so as to withstand a high-air pressure. The cut-offs close automatically.

In the practice of dentistry it is absolutely necessary to have the mouth in an aseptic condition. To produce this effect no doubt many operators use the hand atomizer, which by the continuous pressure of the bulb causes a slight cramp in the hand; with the compressed-air apparatus we do away with this work, the tube is steadied, and thoroughly cleanses the mouth or any cavity. No doubt you have frequently met cases where it would be preferable to place on the rubber dam, but owing to the patient's inability to breathe through the nostrils, the operator is occasionally compelled to send the patient away, or work at a great disadvantage.

How often have you cast about for a remedy? It is a simple one. A two per cent. solution of cocain placed in an atomizer attached to the compressed-air apparatus, which is gaged at ten to fifteen pounds' pressure, and the spray thrown into the nostrils, will invariably relieve that posterior nasal catarrh or reduce the swollen tissues of the nares to such an extent that one can proceed with the work in a few minutes, without any inconvenience to the patient. In using the spray for this purpose have the patient sitting upright in the chair with the head inclined slightly forward; insert the tube horizontally into the nares, and do not apply over ten to fifteen pounds of air pressure, as otherwise an irritation may be set up in the middle ear.

In stomatitis of various kinds, an antiseptic spray employed with high pressure produces excellent results. Before applying any medicines to the gums, it is always necessary to have a dry surface, so that the medicament may be readily absorbed, and to prevent the possibility of its becoming distributed over the surface of the tissues. I found it somewhat difficult to obtain a dry condition of the gums in the posterior portion of the mouth before employing this apparatus. Now I find it a very simple matter. By drawing back the corners of the mouth with a napkin or piece of cottonoid, and throwing the compressed air directly on the spot, it only requires a few seconds to produce the desired condition of the mucosa, and upon applying the medicines immediate absorption is secured. Now I have again recourse to the air pressure, which seems to drive the medicine deep into the tissues. In periostitis I prefer to use the cold air current, which in itself gives relief to the patient.

By the use of compressed air, the application of counter irritants, sedatives, and local anesthetics is made comparatively easy. As deep a degree of anesthesia cannot be obtained with cocain as with the hypodermic injection, but with a four per cent. solution under compressed air I am, after a short space of time, enabled to lance abscesses without pain. If compressed air be used in connection with ethyl chlorid or any of its substitutes, a deeper anesthesia and quicker results are secured than when these drugs are employed alone.

In the treatment of pyorrhea alveolaris it is absolutely essential that every particle of deposit of whatever form shall be removed, and that the débris shall be thoroughly washed away, leaving no particles to be ulcerated out; to do this I use the Davidson spray tubes (attached to my compressed-air apparatus at thirty to forty pounds' pressure) filled with three per cent. hydrogen dioxid and borine equal parts. It throws out such a copious spray that it lifts the gum tissue away from the teeth, introducing the medicament directly into the seat of the trouble, forcing away all foreign particles, and giving a clean, aseptic condition of the parts.

I employ these spray tubes attached to my compressed-air apparatus for introducing medicaments and washing out cavities preparatory to implanting teeth, and in general, for all wounds and diseases of the oral cavity. And now, having considered the advantages from the aid of compressed air upon the soft tissues, I will briefly state the results procured through the medium of this agent on the hard tissues—the teeth.

Drs. Harlan, Kirk, and Truman have demonstrated experimentally that in the dentin liquids are absorbed by osmotic action. Dr. Harlan states that thymol will be diffused in moist dentin in from three to six hours at 98.4° F., that non-coagulants soluble in water are diffused readily through tooth-structure, as has been shown repeatedly in experiments outside of the mouth; that oleaginous non-coagulants pass through the structure of a tooth quite slowly in the presence of water in serum albumin, and that the vaporizable portion of an essential oil will give to the substance which it permeates its characteristic odor in from three to six hours.

Professors Kirk and Truman have shown by experiments that coagulants will penetrate the tooth-structure, and Professor Truman states that in proportion to the coagulating power of the agent will be the penetrating force, independent of gravitation.

These investigators have established the fact that medicines will be absorbed through the tubuli after a certain length of time.

You will remember that the glue-yielding portion of a tooth contains water to about two per cent. of the weight of the entire tooth; bearing this in mind, let me ask you, my colleagues, What can we accomplish after dehydration of the tissues, leaving entirely out of consideration the capillary attraction of these infinitesimal dentinal tubes? It has been demonstrated that when the water is removed from a tooth, the normal function of transmitting impressions seems to be modified. This desiccation can be accomplished by several agents, heat, cold, and chemicals.

We know that heat or cold will produce pain, and in the application of either we should proceed with extreme caution.

I use for desiccating the dentin a hot-air syringe whose chamber is filled with carbon, which is one of the best materials for retaining caloric, and only requires a few minutes over a Bunsen-burner flame to accomplish the requisite amount of heat.

With this syringe attached to the compressed-air apparatus, one can so regulate the flow of air that the tooth will be thoroughly dry in from one to five minutes. Then introduce the obtunding medicament heated to about 95° F., and again apply the warm air current with about forty pounds' pressure. It will then be possible to excavate the tooth painlessly and no subsequent irritation will result from the treatment. In the bleaching of teeth, I find by the application of hot air at a high pressure that I am able to produce the required condition in one-half the usual time, as I can rapidly evaporate the twenty-five per cent. hydrogen dioxid and force it into the tubuli. It is necessary to be cautious in bleaching teeth so as not to whiten them too much, for it is frequently observed that bleached teeth are a lighter color on the following day.

In making a tooth perfectly aseptic, the same method of applying a drug as I have recommended in inducing anesthesia will give satisfactory results both in the tooth and root.

For drying root-canals by means of this syringe, heated air can be carried directly into the canal, and with high pressure antiseptics can be forced through the canaliculi to render them thoroughly aseptic.

In setting pivot teeth, we often find it very difficult to carry the cement into the upper portion of the root. In forcing it into the root-canal with a dry instrument, upon the withdrawal of the latter the cement is generally found adhering to it and not to the walls of the root; but under high pressure it can be forced into every irregularity of the root, while at the same time the compressed air will dry all the surrounding tissues, thereby avoiding the necessity of wiping away the moisture excreted by the mucous glands.

Where heat is caused by drilling with sand-paper disks or strips, by applying the cold air current it is possible to work without any interruption, for it keeps the tooth at about the normal temperature without causing any irritation.

For quickening the hardening of modeling composition or wax impressions, the cold air current will be found of great assistance.

Discussion.

Dr. JAMES MCMANUS, Hartford, Conn. I remember reading the essayist's original article some years ago, and I read it as I have read many others—letting it go by without serious thought. I remember talking many times with Dr. Register on this subject, and still I was not influenced enough to make any movement in the direction of testing the usefulness of this method. A few years ago I was in the office of a dentist in Philadelphia who had a very nice compressed-air outfit, but it required a vigorous man to keep the reservoir pumped full. He was very much pleased with it, and I decided to have a similar arrangement, as I thought I had a boy who could do the pumping. He soon tired of the work, and we decided to put in a larger tank and a pump such as Dr. Freeman has described, with a tube running from the tank to three chairs. We have had that in now for several months, and I can say to you tonight—and many of you know that I have been in practice for many years—that never have I expended any money for dental appliances that has given me such satisfaction—unbounded satisfaction—as has the money spent in putting in that compressed-air outfit. We have used it right along. My son, who is in the special work of treating root-canals, crown and bridge work, etc., is very enthusiastic over it, and as to myself, not doing much work of that kind, the satisfaction I have had, and the satisfaction my patients have expressed in the use of compressed air for sterilizing the mouth, has been the most pleasant thing in my practice for many years.

Dr. WMS. DONNALLY, Washington. I had the pleasure of hearing Dr. Freeman read a paper at Asbury Park about ten years ago. I have found as I treat more and more cases of pyorrhea that his method is a very useful and efficient help in the treatment of these cases. With the appliance that Dr. Freeman has exhibited, it is possible, even with a small point, to reach the bottom of pus pockets. Roots of teeth covered with deposits and bathed in pus, if thoroughly dried with the aid of compressed air and the application of trichloracetic acid around the root, will cause much better results than when the acid is applied without previously drying the roots. I have not been as successful as Dr. Freeman in making suitable points, and I have had difficulty in reaching into the lowest depths of the pockets. It is true that vaporized medicinal agents may be forced into the pockets, but unless these pockets are kept open with an instrument, as satisfactory results will not be obtained as with the smaller points that penetrate deeper.

The essayist has referred to the possibility in cases where there is considerable toxic matter in the pockets, of forcing that matter into the tissues. I think that when the air current is used to clean out the pockets it should be complemented by a strong flow of some efficient germicide. The use of the dry air in desiccating the roots before the application of trichloracetic acid facilitates the removal of the deposits. In many of these cases there is no pus whatever to be found in any of these pockets at the second visit of the patient. If the work be done thoroughly, as the simplest principles of surgery require, it is possible to clean out the pockets in one treatment. This apparatus is useful in many directions, but I have found the greatest satisfaction with it in the treatment of pyorrhea alveolaris. It is certainly a very efficient aid in cleansing and sterilizing the mouth. It is the source of great satisfaction to the dentist and to the patient to realize that the mouth is thoroughly cleansed before any operation is undertaken, and the patient is thereby more favorably impressed.

Dr. G. MARSHALL SMITH, Baltimore. Compressed air has been of great benefit to me in my practice, and I want to thank the essayist for the additional suggestions he has made this evening.

Dr. W. G. FOSTER, Baltimore, then gave a demonstration of the administration of somnoform. After giving a few instructions on the use of the apparatus for administering somnoform, Dr. Foster anesthetized a patient. The administration proved very successful, and the patient remained under the influence of the anesthetic for about one and one-quarter minutes.

The next order of business was an illustrated lecture on "The Uses of the X Ray in Dentistry," by Dr. M. I. SCHAMBERG, Philadelphia.

It was shown how readily diseased conditions about the apices of roots of teeth can be discerned with the X ray. Dr. Schamberg uses the X ray in diagnosing the conditions of the tissues of teeth the seat of chronic abscesses, which are subsequently to be treated surgically. The X ray shows very clearly the extent of the diseased area and constitutes a valuable guide in the performance of the operation. The operation which Dr. Schamberg advocates consists in penetrating the process above the end of the root with a surgical bur, in curetting away the diseased tissue, and excising the end of the root, after which the root-canal is filled and the wound allowed to heal. Dr. Schamberg also gave a clinic during the meeting demonstrating this method of operating.

Another use of the X ray is as an aid in extracting impacted third molars. Dr. Schamberg showed that it was very easy to definitely determine the position of an impacted tooth by the aid of the X ray.

Discussion.

Dr. G. H. CLAUDE, Annapolis. Although I do not like to disagree with Dr. Schamberg, I must take issue with him on two points. The first is that impacted third molars are ever the cause of neuralgia. I disagree with this view, because I do not believe that nature ever placed a tooth to develop in the position where the conditions surrounding it would be productive of pathological effects; the bone will develop along with the tooth and accommodate itself to the abnormal position of the tooth. The other point is, that any pus discharged from an abscess into the mouth would not be naturally destroyed.

Dr. G. **Marshall Smith**, Baltimore. Dr. Claude's remarks remind me of an experience I had recently. It was a case of irregularity with excessive recession of the mandible. The child was brought to me by his parents, who expressed their distress about the condition of the child's face. After many days, weeks, and months of effort, I succeeded in protruding the jaw almost to its normal position. Sometime afterward an aunt of the boy came to me and said that he did not look natural, and that she did not believe that God would have made those teeth recede if it had not been right; that I had destroyed the work of God. Nevertheless, in spite of Dr. Claude's belief, I am convinced that Dr. Schamberg has done a great work for the profession, and I thank him for it.

Dr. J. E. **Power**, Providence, R. I. In support of the theory that impacted and malposed teeth are the cause of many cases of neuralgia, I can recall at least twenty cases which had been under medical treatment from four to ten years, where the conditions described in the essayist's paper were the direct cause of the disturbance. I think if we consider the anatomical relation of the fifth nerve to the maxillary bones, we can readily understand how either of these conditions can produce a pathological condition, which may manifest itself by the pain commonly known as neuralgia. It also seems simple to understand why the area of pain is in many instances in parts remote from the seat of lesion.

Dr. **Claude**. I have seen many cases of neuralgia where there was no impacted tooth. I have seen people have every tooth in their mouth extracted for the relief of neuralgia, and still they suffered. Comparatively, there are few cases of neuralgia among persons having impacted teeth, and I am of the opinion that as many or more cases occur in those having no such teeth. The fact that a few cases are cured by the removal of an impacted tooth does not settle the question.

Dr. L. F. **Palmer**, Baltimore. I would like to ask Dr. Schamberg what film he uses to get such beautiful results. I have used both forms of machine and both tubes, but I have never been able to get a satisfactory result where I wanted to put the film inside the mouth.

Dr. **Schamberg**. There are just a few points to which I would like to reply. With regard to impacted teeth causing neuralgia, I believe that inasmuch as in most cases of neuralgia where impacted teeth were present the removal of these teeth was followed by the cure of the disturbance, we must necessarily reach the conclusion that it was caused by the impacted tooth. The question of the sequence of boils following a fistula in the mouth is one to which I gave considerable attention before I presented it to any society. I was very particular to find out the exact history of the case. The patient had been a sufferer from boils for a number of years. He had been abroad, and had received treatment at several resorts, after which he returned to this country somewhat improved, but still suffering from periodic outbreaks of these distressing lesions. He came to my office more through accident than anything else, to have his mouth examined for another condition, and I found this abscessed tooth. I told him that he should have the tooth removed or the abscess cured. It was extracted, and from that time he has not had a single boil. In speaking of my experience to a medical practitioner of Philadelphia, he was delighted with the prospect of having found some probable cause for boils, because he had frequently had cases where no cause could be determined, and was quite sure that auto-infection, the swallowing of the pus, and its absorption into the system, had caused the boils. We cannot do more than draw conclusions after positive evidence, and we have reason to believe that in the case under consideration the boils were caused by the periapical abscess.

The influence of the X ray on the operator is a point that should interest most men who intend to take up the work.

There is some danger of burning the hands from constant exposure, but these burns have occurred mainly among the early users of the X ray; men who did not realize that there was any danger from constant exposure. Such men have suffered rather serious destruction of the skin and in some instances, from the constant irritation of the X ray, in susceptible patients, cancers have resulted. However, these conditions need not occur. My hands are not burned, neither are those of my assistant. The exposure for radiographic work is so short that there is little possibility of its resulting in burns. Pictures can be taken in from three to ten seconds. There is a slight danger of producing sterility in a patient from exposure to the X rays; that is, if he be exposed to the X rays for many days, he may as a consequence of that become sterile, and for that reason it is well to use proper shields and screens.

Dr. **MARSHALL SMITH**. I move that a vote of thanks be extended to the essayists of the evening who have had the kindness to come here and present to us in such an admirable manner these subjects that have given us so much instruction.

The motion was carried.

Motion was then made and carried to adjourn until Saturday morning.

THIRD DAY—*Morning Session*.

The meeting was called to order at 10.30 o'clock Saturday morning, May 27th, by the president, Dr. S. W. Bowles, Washington.

The first order of business was the reading of a paper by Dr. **BESSIE BURNS BENNETT**, Baltimore, on "The Importance of Dental as Compared with Medical Examination in the Public Schools."

After the reading of Dr. Bennett's paper the President announced as the next order of business the reading of a paper by Dr. **J. E. POWER**, Providence, R. I., on "Oral Sepsis," as follows:

ORAL SEPSIS.

The conditions which are necessary for the growth of bacteria are heat, moisture, and access of oxygen, and in consideration of these conditions we all must admit that the oral cavity is a perfectly constructed incubator for the development of bacteria; hence it is reasonable to believe that the conditions of this cavity at all times regulate the standard of the resistant capacity of the system, that is, the condition favorable or unfavorable to the growth of these micro-organisms.

Long before the fact of the existence of these bacteria in the mouth was known to man, the tongue and adjacent parts of the oral cavity were used as diagnostic guides to the physical conditions of the individual. When the stomach became disarranged the tongue became coated, and we were led to believe that this condition of the tongue was the result of the condition of the stomach. For instance, we sometimes find the tongue of a person coated while no feeling of discomfort is felt in other parts of the system. In consideration of this statement, which is based on fact, is it not reasonable to suppose that the bacteria which we know are present in the mouth are allowed to increase and develop, but that our attention is not attracted to this condition until the stomach and other organs become so affected as to cause a general systemic weakening.

After the bacteria have colonized, their path of infection may be through the lymphatics or natural channels to a section of damaged tissue, and, the condition thus affecting the highly vascular tissues together with so many glands, who can say that many cases of diseased lungs, kidneys, and heart are not the result of specific bacteria which are always found in the mouth, whose lining walls furnish conditions conducive to transmigration? Hence the study of the paths of entrance of the pyogenic organisms to these organs is one of the educational obligations of the dentist.

When the dental profession calls the attention of the world to the importance attached to this subject of systemic disease in which the conditions of the oral cavity are etiological factors, the other professions will recognize that the practice of dentistry today is far in advance of the circumscribed method of fifty years ago, and that dentistry is not merely the application of mechanics, but on the contrary presupposes a knowledge of medicine; perhaps a knowledge not as broad as that required of a general practitioner of medicine, but a knowledge which is sufficiently developed and extended to practice dentistry as a specialty of medicine. It is true that much of this medical culture must be acquired after graduation, but such culture is absolutely essential to the intelligent practice of dentistry.

Clinical bacteriology has demonstrated that practically every part of the body may be affected by the bacteria found in the mouth, and this condition is generally manifested by pathological reaction, which may extend from simple hyperemia to suppuration. Conditions such as osteomyelitis, multiple suppurative arthritis, etc., are examples of this form of infection. In some cases the lungs are affected, at other times the kidneys, heart, liver, intestines, and other organs. Numerous species of bacteria are found in the mouth under normal conditions, some being harmless, it is true, but we also find the pathogenic bacteria of diphtheria, typhoid, cholera, pyemia, and pneumonia, diseases which are in many cases fatal to man. Not only these diseases, but inflammation of the valves of the heart is a disease that may many times be traced to oral infection. This generally follows attacks of pneumonia, and cultures taken from affected areas of the heart will present the pneumococci. Now, the pneumococci is found in the mouth during the process of the disease, as well as in a mouth during health.

It is said by some writers that the normal saliva has the power of destroying or retarding the growth of these pathogenic bacteria. These same writers admit, however, that at other times it is an excellent medium for their development, and it is far more difficult to determine just when the saliva ceases to be normal than it is to destroy the bacteria, or at least to arrange conditions that will impede their growth. In recognition of the fact that science has proved their existence, it is our duty to adopt measures for their destruction.

Sterilization of the oral cavity, as far as this end can be accomplished, is strongly recommended by many eminent medical authorities—including Dr. John H. Musser of Pennsylvania—as a progressive step in the treatment of pneumonia. His first step in the routine of mouth-sterilization is to place fifteen grains of calomel on the back of the tongue of the patient. This is an admission that these bacteria in the mouth are active in prolonging the course of the disease. No one disputes the fact that during health the pneumococci are present in this incubator (the oral cavity), days and even weeks before their presence is manifested by their attack upon the lungs. If we know therefore, as we do know, that these bacteria are present in the oral cavity, and that conditions most favorable to their incubation exist there, more than in any other part of the body; that their attack upon the air passages must follow their presence, and perhaps their growth in the oral cavity, it does seem like criminal negligence to neglect to bring about their destruction, and also to remove those conditions which are favorable to their existence.

All of us have examined mouths where were ill-fitting crowns, plates, bridges, improperly contoured and improperly finished fillings, porous fillings, and fillings where the excess at the cervical margin has not been removed but is left projecting, the gum tissues folding over this, thus forming a reservoir with a cover upon it. All these conditions produce enough pockets to supply septic material to operate a bacteriological laboratory for a study of almost all species of pathological organisms. Broken down or badly decayed roots are other conditions which the dentist of today should not allow to remain in the mouths of patients who are under his care. In a great many cases the patient will refuse to have such conditions interfered with, on the ground that the roots have given them no trouble; they might with equal sense refuse to have a carcinoma removed until the whole side of the head was involved. In such cases we should insist that they be governed by our advice or go elsewhere, and also that our advice is of more value than that of the person who has never made a study of the subject. In other cases I have known of dentists advising non-interference until such roots commenced to give trouble. And then consider the number of death-producing bacteria that may be on one root above the gum, not to speak of the septic condition beneath it in the way of abscesses, etc. We cannot repress the thought that such men are a hindrance to the progress of dentistry and are guilty of malpractice. In certain cases of malposed teeth, especially the upper third molar, whose position in many instances will be such that it is almost a physical impossibility to keep clean the pocket that is made by its relation to the second molar, I advise extraction whether or not the tooth is diseased. Within the last three months, I have been instrumental in assisting in the complete cure of tonsillitis by the extraction of the upper third molar. One case was that of a young man, twenty-eight years of age, who had been under treatment of a general practitioner for four weeks previous to his visit to me, during which time his throat was in such a state of inflammation that the pain associated with his attempts to take even liquid nourishment was intense. He was referred to me by his attending physician for examination and advice.

I found upon examination that the posterior part of the mouth and the throat were highly inflamed. The teeth were in good condition, free from caries. The upper right third molar was malposed, forming one of the pockets described earlier in this paper. The tooth was covered with decomposed food in the buccal surface; the pocket was filled also. I advised extraction of this tooth, as well as the removal of an ill-fitting bridge, prescribed a mouth-wash, and discharged the patient with instruction to return forty-eight hours later. He presented himself at my office as directed, and reported to me that within three hours after his first visit he noticed a marked improvement, which increased rapidly until thirty-six hours had elapsed, when his condition, so far as discomfort was concerned, was normal.

Now, in consideration of this, it is fair to say that these septic conditions in the mouth were at least the exciting cause of the inflammation of the tonsils and surrounding tissues, and if infection can be carried this distance, on what grounds can we say that the path of infection ceases here? On the other hand, we know of cases where the infection is carried to the lungs and heart.

Rheumatism is generally preceded by inflammation of the tonsils, and bacteria found in this condition are always found in the saliva.

The following case, which I had the good fortune to observe, may be of sufficient interest to report in connection with this part of my paper. A blacksmith, about forty years of age, robust and healthy, six feet tall, and weighing 225 pounds, was among the patients at the hospital clinic. He had always enjoyed good health until he was so unfortunate as to have his lower jaw fractured. This fracture was not properly reduced, and the inflammation which followed the irritation caused by the loose fragments progressed, until suppuration and destruction of the part followed. This pus had been continually swallowed by the patient, and after six months he died of tuberculosis of the lungs. It might be interesting to say that the family history so far as tuberculosis was concerned was negative. We know that the tubercle bacilli exist in healthy mouths, and we also know that any septic material, such as decomposed food or pus, is excellent medium for their generation, hence is it unfair to say, in this case at least, that the predisposing cause of tuberculosis was the result of a septic or unclean mouth?

Disease of the middle ear also may be traced to a septic mouth. We know that this form of disease is a sequel to diphtheria; we also have reason to believe that the path of infection is through the Eustachian tube from the tonsils, so it is also reasonable to believe that bacilli of this disease were present, multiplying and developing several days, and perhaps weeks, before their manifestation was made known by disease. In disease the resistant capacity of the system is lessened, and when we know of the existence of these bacteria we should destroy them before or during their incubation, thereby avoiding disease.

Even with a knowledge of these conditions we often hear men say, You cannot infect the mouth. My surgical experience has taught me that this statement is without foundation, and I have seen many cases where infection of the oral cavity followed the extraction of a third molar, when all the rules of sepsis were observed, as far as instruments were concerned, but no attention was given to the oral cavity previous to the extraction. The general surgeon who performs a laparotomy today would no more think of opening the abdomen without first washing the tissues thoroughly with antiseptic solutions, and in many instances, hours before the operation, placing a wet dressing of carbolic acid or some other equally effective antiseptic, than he would think of operating without changing his clothing.

Of course we cannot apply this treatment in all our cases, but when we really believe and know that bacteria exist in such great quantities and that the secretion of this cavity is richer in bacteria than is the foulest sewerage, it does seem like malpractice to extract a tooth, incise an abscess, scale teeth, or in fact to lacerate the tissues in any manner that would make an avenue through which all these bacteria could enter the system. If we do not sterilize the mouth with mouth-washes, compressed-air sprays, or some other way, several days before operation, and always when it is possible, just after operating and for several days following, we are again guilty of criminal negligence. By studying the anatomical structure of these parts, it can easily be understood how extensive inflammation and even pyemia and septicemia may result from such carelessness.

Netter, by his experiments, found ten per cent. of all individuals examined by him at random contained the staphylococci pyogenus aureus and pyogenus albus, and that pneumococci were present in fifteen per cent. of the mouths of healthy persons. The work done by Kirk has demonstrated that pneumococci have been the exciting cause of pericemental abscess, and the records of the experiments of Schiever tell us that their presence was noted in seventy-five per cent. of apical abscesses examined by him. The bacillus typhosus—the bacillus of typhoid fever—is found in the mouths of healthy persons, while Vulpian produced septicemia by inoculating animals with saliva from a healthy man. Some of these might be called accidental inhabitants, whose period of residence is in proportion to the degree of the conditions required by the bacteria for their development. It has been demonstrated that the staphylococcus can be cultivated from the saliva of a healthy man, and I might add that I had this very painfully impressed upon me some few years ago by having my finger and arm infected to such an extent that I was operated upon three times in fifteen days. In this particular case, the patient, who was a colored man, had an unusually clean mouth. He was sent into the hospital suffering from a fractured jaw. I examined him directly after his arrival, using the ordinary precaution of washing the hands before and after placing my fingers in his mouth for the purpose of examining the fracture. Within twenty-four hours I had symptoms which proved that I had been infected, presumably through an abraded surface on my finger, through which the bacteria entered.

The importance of the subject of oral sepsis extends farther than its application to medicine. It is of equal importance to surgery, as may be noted in watching the operating surgeon prepare himself before beginning to perform an operation.

First, he changes his clothing for a sterilized operating suit; then he washes his hands and arms in solutions which are supposed to destroy bacteria. Now, as a double precaution against the possibility of the transmission of organic life, he covers his hands and arms with sterilized rubber gloves, his assistants following him in every detail in the matter of sterilization. Next, the abdomen, if the operation is laparotomy, is thoroughly washed with ether and some other antiseptic solution. Everything is now ready, and the surgeon makes an incision into the abdomen, and proceeds with the operation. No attention has been given to the mouth of the operator, not even washing it with some antiseptic solution. During the operation his head is covered, but no covering is placed over the mouth. It has been demonstrated by Flugge and by others that during ordinary speech, in the pronunciation of any words commencing with the letters d, k, p, and t, saliva is projected laterally several feet in great quantity, and that these minute drops of saliva may be set free in just as large quantities during whispering as during ordinary speech. The latest scientific reports show that each of these drops contain 4375 microorganisms, among them being the streptococci, staphylococci, and diplococci. Now, we all know that this class of bacteria is exceedingly virulent, and when we see the operating surgeon talking into the wound during a laparotomy, we cannot help feeling that he is not consistent in the preparation of his barrier to septic infection, and who can say that some of the cases of infection which follow abdominal operations are not the result of the bacteria being transferred to the wound by talking, which seems to be a part of every operation.

Previous preparation of the patient is regarded as a very important step in the success of the operation, yet no attention is given to the oral cavity, the place where all agree exist the greatest number of pathogenic organisms. With the number of deaths due to post-operative, septic, and inspirative pneumonia, it would seem justifiable, and consistent with other steps in surgery, if the mouth were sterilized before an operation, all particles of food removed from between the teeth, etc.; then, if the patient did inspire saliva or any particles of food, while these particles might not be sterile, they would at least be free from some of the most virulent forms of bacteria.

I have seen the introduction of some of the steps in this crusade against bacteria to prolong human existence, and I advocate their increase until the mouth will receive the attention it should, as an etiological factor in the success of surgery as well as of medicine.

When compressed-air spraying machines become part of the operating-room outfit of a hospital; when the general surgeon and his assistants sterilize or spray their mouths before attending an operation, and when the mouth of the patient receives the same attention as does that of the general surgeon and assistants, then, and not until then, will the preparation for a surgical operation be complete. Then, and not until then, shall we be consistent in our preventive measures against bacteria. Whether we will have any more successful laparotomies and whether we will have any less septic pneumonias, time alone can tell.

It is now an accepted fact that the conditions necessary for the growth of bacteria are heat, moisture, and admission of oxygen. All these conditions are present in the mouth, hence we have an incubator superior to any that might be artificially constructed; we know that many death-producing bacteria are incubated every minute. Science has demonstrated that these bacteria can be destroyed without injury to the individual. Certain practitioners have accepted this fact, and apply it as a progressive step in the treatment of certain diseases. Now, we know that during disease the resistant capacity of the system is lessened, and if these bacteria can be destroyed during disease they can with greater care be destroyed when the resistant capacity of the system is highest, during health. If we destroy these bacteria before their complete incubation, is it not reasonable to suppose that the period of sickness of the individual would be shorter, that the condition of sepsis would be greatly restricted, and that many diseases, such as tonsillitis, pneumonia, diphtheria, influenza, dyspepsia, disease of the ear, and several others too numerous to mention, would be almost unknown?

When such attention is given to the oral cavity, we can safely say that we have gone one step farther in medicine, dentistry, and surgery.

Discussion.

Dr. M. I. SCHAMBERG, Philadelphia, Pa. It occurred to me while Dr. Power was reading his paper that the mouth bears the same relation to the alimentary tract that the external face does to the rest of the dermal covering of the body. An eruption that occurs upon other parts of the body is liable to manifest itself upon the face, and altered conditions of the mucous membrane of the mouth are ofttimes the reflections of disturbances in other parts of the alimentary tract. Dr. Power states that the tongue is a guide to the condition of the stomach. It is equally true that the stomach is largely influenced by conditions in the mouth. There appears to be a reciprocal action between the mouth and the alimentary tract. It is therefore important, if we are to safeguard the general health of our patients, that we forcibly direct their attention to the necessary hygienic care of the mouth.

I wish to verify Dr. Power's statement relating to the frequent involvement of the tonsil as a result of diseased pockets about third molars. I have seen many cases of tonsillitis due to no other cause, and have also encountered many deep-seated suppurations of the neck due to infections in the region of lower third molars. This is probably due to the close proximity of the roots of these teeth to the submaxillary triangle. In these cases the X ray has proved a help to me in locating the tooth at fault, and the treatment in most instances consisted of its surgical removal, followed by careful post-operative attention to the socket. Every attention should be given to the thorough cleansing of the mouth prior and subsequent to the performance of any surgical operation about the mouth, whether it be removal of a tooth or the resection of the jaw. This applies particularly to the treatment of fractures of the jaw, for frequently neglect in this direction produces infection which not alone retards union, but may cause more serious complications. The best point brought out in the paper is Dr. Power's reference to the negligence of most surgeons, and I dare say dentists, in not properly disinfecting their own mouths prior to performing operations. The importance of this measure may be realized by keeping in mind the fetid condition of the average interdental space. About two years ago, before the New Jersey State Dental Society, Dr. D. D. Smith alluded to a practice of passing a piece of floss silk between the teeth of his patients and then allowing them to get a whiff of the odor, so as to assure them of the putrefaction that takes place in these spaces. That inelegant yet positive test should prompt all of us, whether we practice dentistry or surgery, to frequently disinfect our own mouths, for in our work we come in close contact with the parts upon which we operate. Many dentists inhale the breaths of their patients as well as impart their own to their patients, and it is quite possible that in this way an interchange of germs may take place. When we keep in mind the frequency with which syphilis is found in people of high social standing we must realize the necessity of employing precautionary measures against infecting ourselves or our patients. Unfortunately we are too prone to adopt slipshod methods, failing to realize that many mouths contain organisms which if transmitted to other patients may be the source of irreparable harm.

Dr. JAMES McMANUS, Hartford, Conn. The paper of Dr. Power presents the highest ideals of oral asepsis. When we consider this subject of bacterial infection we want to stop and think of the condition of this world of ours before we knew about bacteria, and we want to realize that people lived and died then just the same as they do today. When we think of all that the scientists and surgeons try to impress upon our minds with regard to sterilization, and then when we occasionally find the surgeon in a confidential mood, telling us he does not think it possible to thoroughly disinfect the hands, we will realize what a hard proposition we have before us in trying to sterilize the mouth. You know how thoroughly the surgeon and his assistants prepare themselves prior to the performance of an operation, washing and sterilizing the hands repeatedly, and putting on rubber gloves in view of further protecting the patients. Yet no attention is paid to placing the mouth in an aseptic condition.

However, in view of the impossibility of using strong antiseptics in the mouth, the high ideals of the author cannot possibly be so thoroughly carried out.

I want to say a few words which have been brought to my mind by this paper. A few years ago Dr. Fones—describing his daughter's experience in far-off Africa, his daughter being the wife of a missionary—spoke of the habit of the natives of cleaning their teeth with a stick, quite in advance of our enthusiast of Philadelphia. He said these Africans would polish their teeth with a stick after each meal. Another friend has related to me his experience in Jamaica during the past winter. He was interested in watching some of the negro sailors on a vessel in the harbor. He happened to be on the vessel about meal time, and saw how these men would thoroughly rinse their mouths before and after meals, and how they would go on the deck and polish their teeth with sticks. Now, I would like to know how many dentists, how many of our patients among the cultured and intelligent people of the country, with all the advantages at our command, rinse their mouths thoroughly before and after their meals. In that respect the people of those benighted countries are far ahead of us. We do know that in spite of all our efforts it is difficult to induce our most particular patients to come to us with clean mouths. They will all tell us that they brush their teeth regularly, but that morning they happened to be in a hurry to keep some appointment. That is the kind of experience many of us meet with. It is one of the responsibilities of the dentist, to impress upon the minds of his patients as far as is possible the necessity of properly taking care of the mouth.

I think that since the introduction of compressed air the profession has today in a certain way better facilities for accomplishing good along this line than heretofore. It is a fact, that if used as often and as thoroughly as it should be, the mouths of our patients will be nearer to a state of health than before. And with all the improved appliances that we have at the present time, we can most certainly before commencing operations, place the mouth in a tolerably clean condition—I will not say thoroughly aseptic condition. The spaces between the teeth can be thoroughly cleansed by means of the air, and the mouths made comfortable thereby.

There is one fact of which I think a great many people are not aware, and dentists do not as a rule impress it upon their minds in a sufficiently emphatic manner. It is with reference to the many preparations to be found today on the market for the cleansing of the mouth. The average person rinses the mouth for a few seconds with a solution made by putting a few drops of any of these preparations in water. Now if there is any truth in the statement that it is difficult to kill germs, even by boiling for fifteen minutes, I say that the rinsing of the mouth in this way does no good, except to flush the surfaces of the teeth. It has been my custom to try to impress upon patients that whenever they use anything in the way of a cleanser it should be water, and enough should be taken into the mouth to distend the cheeks, moving the muscles so that it will pass between the teeth, as in that way the mouth can be more perfectly cleansed. I tell them to hold the water in the mouth and to rinse it thoroughly while counting up to twenty.

Dr. F. L. Fossume, New York, N. Y.

The paper of Dr. Power is of value not only to us as dentists, but to the public as well. Everything we do toward keeping the mouth in a state of health is a step in the right direction. The recognition that the mouth deserves as a factor in its relation to the general health is at last being given to it, and the effects on the nutrition and the nervous system of pathological conditions of the organs found in the oral cavity are receiving the study and attention they deserve.

I would like to mention the case of a gentleman, aged forty-two, who had suffered from malnutrition and malarial symptoms for more than four years. I found four discharging fistulæ in his mouth. After his teeth had been treated, the root-canals cleansed and sterilized, the necrosed bone curetted away, and the mouth put in order, the patient gained fifteen pounds, and has been in good health since.

The dental surgeon should be an example in his office, and by the condition of his own mouth should prove to his patients and to the public that it is possible to keep the mouth in a reasonably aseptic condition, and that it is well worth while to do so. In our offices we have the opportunity of showing to our patients the care we take in keeping our instruments clean and sterile. In addition to this, I believe it to be our duty to have our patients bring their tooth-brushes to our offices occasionally that we may give them instructions as to how to clean the teeth. In this way I believe we could educate the public to keep their mouths clean.

Dr. Morris of New York has done fine work in the matter of calling attention to the necessity of cleansing and attending to the mouths of patients before certain operations, and he has found that many deaths have been due to infected tooth-sockets, caused by the extraction of teeth where no aseptic precaution had been taken either before or after the operation.

Dr. S. Freeman, New York, N. Y. With regard to brushing the teeth, I have my patients prepare for themselves a small piece of linen or mouth-napkins which I tell them to use with either one of the preparations of hydrogen dioxid and also a tooth-powder. With that linen or mouth-napkin on the index finger, it is possible to reach every portion of the mouth, and after so doing the use of a suitable mouth-wash, pumped into every possible crevice of the mouth, will give entire satisfaction. This I think is one of the best methods in conjunction with the tooth-brush we have, and much better than the tooth-brush alone because as I have already said, one is thereby enabled to reach every part of the mouth.

Dr. Wms. Donnally, Washington. The essayist has not gone into the technique of cleansing the mouth, but he has very admirably called our attention to the principles by which we can work it out correctly in our practices. I believe that the increasing appreciation of the importance of this subject will lead to improvement in our practice, and will help us to recognize the fact that gastric and intestinal disorders are caused not so much by faulty mastication as by infections produced by the passing of septic matter from neglected mouths along the alimentary tract. I am sure that if we will watch patients we will find that in many cases, when the resistance of the body is lowered by any cause whatever, the condition of the mouth becomes more serious, and in consequence systemic disorders occur.

Dr. Oscar Adelberg, Elizabeth, N. J. I think the remarks of Dr. Freeman indicate a step in a backward direction—a retrograde movement in the profession. Any man who advocates the use of a cloth in preference to the tooth-brush is taking a backward step. The tooth-brushes made nowadays are made with a view of reaching all parts of the teeth and spaces in the mouth. How can anyone with a cloth reach between the teeth into the interdental spaces, and around the gingival margins? If we think for a moment of how difficult it is to reach these spaces with instruments, we will readily realize that it cannot be done with a cloth on the finger. With due apology to my friend, I wish to protest against any such heresy being promulgated here.

Dr. Freeman. If Dr. Adelberg does not know how to use the mouth-napkin, it would be a pleasure to me to teach him the method. I will show him that he cannot reach every part of the mouth with the tooth-brush, but will prove to him that every surface can be cleansed with the napkin in the manner I have explained. A mouth-napkin used in conjunction with the tooth-brush is far preferable to the use of the brush alone.

Dr. Power. I will first reply to the speaker who seemed to question whether dentists could ever reach the high ideals mapped out in my paper to prevent sepsis in the oral cavity. This, of course, is a proposition difficult to answer, but if a great number fail to observe these rules, such action should not be made to imply that the latter are wrong, but on the other hand, it may mean that these men who are neglecting these precautions, whether or not the cases under their care recover, are not only a hindrance to the progress of dentistry, but are guilty of malpractice.

Another speaker stated that during his practice of twenty-five years, he had never met with one single case where the results had been like those described in my paper through disregard of the rules of asepsis. To this gentleman I will say it would not be a proof that these cases do not exist even had he practiced fifty years or longer without encountering any such cases. Fortunately—or unfortunately—most, if not all, of these serious and sometimes fatal cases, where the conditions are the result of carelessness on the part of the attending practitioner, are seen by a very small part of the profession, and I can safely say that those who have been so fortunate as to see such will in the future observe all possible rules of asepsis.

Another gentleman asked what became of the people before we knew that all these bacteria existed, etc. To him I will say that it is not unfair to presume that many of them died, the cause of their death being at that time unknown. Many persons die every year from pneumonia, and other diseases, the source of infection being in such cases the neglected condition of the oral cavity.

Some time ago I had the honor of hearing Professor Robert Morris read a paper on "Infection of the Lymphatic Glands of the Mouth." I was not at that time as familiar with the subject as I am today. The doctor pointed out where several cases of apical abscesses upon molars which had been extracted during the time of the swelling had terminated fatally. My experience teaches me that the time to extract teeth is when the abscess is fully developed. It is a mistake to wait until the swelling subsides. Within the last two years I removed one side of the maxilla of a child eight years old. In this case the disturbance was caused by a tooth in an abscessed condition, which was allowed to remain too long. I agree with Professor Morris that a great many patients die in cases of this kind, not because the tooth is extracted, but because the sterilization of the cavity is not carried out as far as is possible.

I realize that the mouth cannot be sterilized, but we can at least improve its condition, especially in cases in which it has been unduly neglected. Dr. Morris stated that most of the patients who died consequent upon the extraction of teeth, the seat of abscesses, first became affected with pneumonia. It is not unreasonable to believe that the bacterium was drawn into the lungs, and that this might have been prevented if the mouth had been sterilized (as far as practicable) before and after the tooth was extracted.

The subject of Dr. Power's paper was passed, and the next order of business was the reading of a paper by Dr. J. A. Libbey, Pittsburg, Pa., on "The Whiteside Crown."

Dr. L. Ashley Faught, Philadelphia, Pa., then read the following paper:

The Choice of Proper Filling Material.

In choosing to speak to you upon the choice of a proper filling material, I am well aware of the magnitude of the subject. Volumes could be written, and yet much be left unconsidered. My aim, however, is to touch only a few practical points, and in so doing to give to you my guiding rules in daily practice. To insert a filling into a tooth is one thing; to so fill teeth as to save them, surely and comfortably, quite a different matter. This result will depend very largely upon the choice of proper filling material. This choice is made almost intuitively by those of us who have been some years in practice; but to the novitiate, during his early years, it presents a problem of considerable difficulty. He is impelled by a desire not only to do the best for the patient, but is perturbed by a recognition of the influence which each service he renders must have upon his future success. His choice cannot be based upon his experience, but must be made out of the largeness of his learning, dependent upon the experiences of others. Dental meetings and the reading of papers attain two objective points: the presentation for record of new advances and discoveries obtained from original study and experimental research, and the epitomizing of already well-established principles of practice for the benefit of both young and old. The advance in attainments of the profession is as much based upon this second point as it is upon the first, if not more so. Here is the largeness of the learning of the young practitioner, and here is ever to be found the reason for the reading of a paper of this character.

Recently, while in attendance upon a dental meeting, I heard one of the speakers upon the subject of porcelain inlays say that notwithstanding a due recognition of the value and appropriateness of porcelain as a filling material for cavities in the oral teeth, he was still a firm believer in gold for some of these conditions. To illustrate his statement, he mentioned the case of a young lady of moderate means who came to him desiring to have the corner of an upper incisor restored by the use of porcelain. He told the patient that if she insisted upon it he would treat the case with porcelain, but if the choice was left to his professional judgment he would choose gold, although the fee for the gold treatment would be greatly in excess of that for porcelain. The patient decided she could not afford the larger fee, and besides, for esthetic reasons, preferred the use of porcelain. The porcelain corner was inserted against the knowledge and judgment of the dentist as to the choice of proper filling material. I relate this, gentlemen, because it presents an important choice. There is in the situation much food for thought. In view of the porcelain wave at present sweeping over the profession, to here choose and advise gold required courage, but was based upon mature experience, and should teach us all not lightly to lay aside old ways and methods and materials. There is also involved another phase. How far is the choice of filling material to be made dependent upon the caprice or financial condition of the patient? I trust that those who discuss this paper will discuss this point, for is it not here that the young practitioner meets a pitfall? and, more than all, are not the hands on the dial marking the progress of the profession set back by each submission to such control? For my own opinion, I will say that I think so, and I deal only with conditions in which the patient comes without question for professional advice and treatment.

If a gold filling properly inserted in a properly prepared cavity is the best known method of preserving any tooth, then is this paper without point. Such has been quite emphatically stated time and time again. That it is open to question is my belief, and our choice includes gold, porcelain, tin, amalgam, gutta-percha, and zinc-phosphate. Just when and where we shall use each of these depends not so much upon the size, location, or depth of the cavity—though these are controlling factors—as upon the structure of the tooth. Compatibility of filling material with tooth-bone is the foundation-stone for the successful saving of teeth, and the chief reason for choice of filling material is the structure of the tooth.

Very dense and very sensitive: Zinc

oxyphosphate, dependent upon location. Amalgam. Tin.

Very soft and sensitive: Gutta-percha-stopping-lined, and unlined amalgam.

Dense and not sensitive: Gold. Tin. Amalgam.

Soft and not sensitive: Gutta-percha stopping. Tin. Amalgam.

This table of Professor Flagg's is offered here as a good basal one for any practitioner to work upon. Deviation from it is to be made only when the knowledge of the operator is sufficient to warrant it.

The choice of proper filling material may be governed by the ability of the operator to handle any given material. If it be recognized that one has not the ability to make good gold fillings, then gold should not be chosen for any but the most easy and accessible places; for as gold is the most difficult, tedious, and expensive of all filling materials, to attempt an operation of a doubtful character in inaccessible places is to invite failure.

At the other end of my list of filling materials stands zinc phosphate, and to it I fear choice is too frequently given as a present solution of trying conditions. This material is generally considered of such easy manipulation that failure from error in mixing and applying it would seem to be positively eliminated. It has, however, at the hands of its most expert manipulators, proved so treacherous as to indicate that a positive and definite knowledge is quite essential to its proper use. Indeed, it is so hedged about, even when properly used, by peculiar conditions influencing success and failure as to seem to defy comprehension. It should therefore, with a single exception, rarely be chosen as a filling material, unless to subserve the most temporary purpose; or if chosen as a filling material, should never be placed in any mouth save those which are known by the operator to come so frequently under his observation as to guarantee the most careful watching.

The single exception which I would make is this: I would choose this material and place it—not infrequently without any cutting of the tooth tissue whatever—in the sulci of molars and bicuspids just after their eruption, expecting to most thoroughly protect these teeth while they are lying low in the gum tissue, and while in their softened condition they are coming to their mature position in the arch. Zinc phosphate has to my mind a distinctly marked-out place of usefulness, but, other than the uses cited, not as a filling material at all. Its chief use is a lining material, to strengthen frail walls, to improve or to keep the color of the tooth, to fill in and occupy the bulk of space in large cavities, with the intention of covering it out to the marginal edges of the cavity with gold, porcelain, tin, or amalgam. Careful observation and study of zinc phosphate for many years has fully convinced me that unless the layer of dentin over a pulp is exceedingly thin, it can be used and directly applied without the slightest detriment to the pulp.

The choice of filling material is not infrequently to be governed by the position of the required filling, and the nature of the work which it will be required to do. As a rule, gold is yet our best material for restoring contour, when the filling must come to and include the occlusal surface of the tooth. Porcelain in these positions has yet to demonstrate its ability to stand the stress to which it is subjected. In molars and bicuspids there is against its use the fact that it will not wear down with the tooth tissue as will other materials; and when used in mouths where attrition is likely to make inroads upon the antagonizing surfaces of all the teeth, it must eventually produce in the near future a very sick tooth which under certain circumstances may give the patient great annoyance.

In any choice of gutta-percha as a filling material for other than temporary purposes, assurance should be had of decided indications for its use. Valuable as it may be when so used, a curb should be placed upon the indiscriminate and unwarranted placing of this material in large quantities in any mouth. There is strong reason to believe that diseases of the throat and tonsils are frequently greatly aggravated, if not ofttimes induced, by the baneful presence of this germ-harboring material; to say nothing of the offensive condition of the breath to which the patient and the patient's associates are subjected. There is, however, one place in which its value is so marked that I am constrained to mention it. In the mouths of careless and uncleanly patients wearing artificial dentures, decay will frequently attack the clasped teeth and the lower oral teeth where the plate rests upon them. The checking of decay in these positions, and the preservation of the teeth, are frequently only to be accomplished by choosing gutta-percha as a filling material.

In repair work, the choice of filling material should be such as will change the polarity of the former relationship. Gold fillings are therefore usually to be repaired with amalgam and amalgam fillings with gold.

In conclusion, I wish to insist that the choice of proper filling material is not only to be governed by such rules as will indicate the greatest preservation of the tooth tissues, but very decidedly by a knowledge that the material used will afford also protection to the soft tissues in which the teeth rest. The protection of these tissues, the maintenance of the mesio-distal diameters of bicuspids and molars—indeed of all the teeth—demand that the filling material chosen shall have the property of restoring original contour and contact, with sufficient ability to resist the stress of antagonism and the other destructive forces at work. Our effort should be not only to preserve individual teeth, but also to do it so as to guarantee their comfortable relationship one to another, and to maintain the entire dental arches in their proper antagonism. The choice of proper filling material should ever have in view the full purpose and usefulness of the dental organs.

Discussion.

Dr. H. C. Thompson, Washington. In the practice of any profession or in the prosecution of any calling, be it mechanical or artistic, there must be a recognition of the importance of carrying out the detail based upon a proper knowledge of the physical properties of that which is to be substituted for that which is lost. If we study the adaptation of materials in tooth-conservation and repair, we cannot but come to a recognition of these two qualities; namely, the quality of the material to be saved and the physical property of the material to be used for saving it. Herein lies the secret of a successful practice of dentistry. The man who desires to fill his pocket, instead of teeth, with gold, may be a more successful financial dentist, but the man who properly judges his material and places it in such a position as to meet the requirements is the man who is a successful practitioner of dentistry. When it comes to the financial side, the man who uses amalgam instead of gold, because of the patient's inability to pay for gold, is doing the patient an injustice, and it would be far better for him to send the patient away without operating than to put in the tooth an inferior material if such material will not save it. Therefore I say that when a man selects a material to fill a tooth, it should be with the idea that it is the best adapted to meet the conditions, and the paper is one that emphasizes the stand I take: that the true practitioner will consider the question of compensation as a secondary consideration.

Dr. G. H. Claude, Annapolis. I agree with the essayist in his paper, and in his rules as laid down for the selection of filling materials. I want to give an observation that I have made with regard to the filling of approximal cavities, one with gold and the other with amalgam. In cases of this kind, where there is every evidence of perfect work in each case and no shrinkage in the amalgam, the noble metal (gold) will sooner or later give way, and the amalgam filling will remain. So I will suggest in addition to what he has said, that where it becomes necessary to fill one tooth with gold and the other with amalgam, we should have a combination of the two metals; that is, in two approximal cavities where the distal one is to be filled with gold and the mesial one with amalgam, we should put amalgam underneath the gold filling along the gum line, in order to neutralize the galvanic action that takes place in these cases. I have noticed this in a number of cases, and I think we should establish a rule of practice.

Dr. E. Holly Smith. I think we are under great obligation to Dr. Faught for this paper, and it is a source of much regret that he could not be here to read it himself, and answer the points brought out in the discussion. The training of the dentist should develop a nice discrimination in the selection and application of filling materials to the conditions to be met. We all have seen clever operators who lacked judgment as to the best material for certain operations. They may be far above other men in mechanical ability, but they do not have the proper judgment as to the selection of materials. In the development of dentists we should impress this point; that we are not only mechanics but that we are physicians, and we must learn to make use of all materials within our reach for the comfort and well-being of our patients.

The subject of Dr. Faught's paper was passed, and the next order of business as announced by the President was the reading of a paper by Dr. Richard Grady, Annapolis, Md., on "Dental Fees and Broken Appointments."

After reading his paper, Dr. Grady presented the following resolution, which was adopted:

> Resolved, As the sense of this meeting, that there should be concerted brotherly action for mutual protection in financial matters; and that a tactful and resourceful committee on litigation should be appointed in the respective organizations to advise members, and, if desirable in its judgment, have power to give moral and financial support in protecting the interests of the dental profession.

On motion the convention then adjourned until the next annual session.

PENNSYLVANIA STATE DENTAL SOCIETY.

Thirty-seventh Annual Meeting.

(Continued from page 169.)

Clinics.

Dr. W. W. McKay, Philadelphia. "Porcelain Crowns and their Construction." Dr. McKay's clinic consisted in showing each step in the construction of porcelain crowns to the completion of the work. Twelve different kinds of crowns were shown.

Dr. M. B. Culver, Philadelphia. "Insertion of Fillings of Platinum-Gold in Conjunction with Gold."

The objects of Dr. Culver's clinic were as follows: (1) To show the manipulation of platinum and gold in conjunction with soft gold; (2) To show the contrast between an entire gold filling and one faced with platinum and gold. A cavity in an upper second bicuspid was used to illustrate this method, the cavity extending well around on to the buccal surface. The bulk of the cavity was filled with Williams' gold No. 4, the mesio-buccal edge and the occlusal surface being finished with Williams' No. 60 rolled platinum and gold in combination, shade No. 3.

The advantage of this operation is readily seen when used in places where pure gold would be very conspicuous.

Dr. J. F. Mayer, Philadelphia. "A Combination Method of Making Gold Caps."

The Sharp swager is employed for the purpose of striking up the blanks. The dies used are those offered to the dentist by Dr. Kellogg, making a change by cutting from the edge of the cusp halfway down to accommodate the blank selected for the particular case on hand. The dies correspond to all of the plungers on the press. Wire measurements arranged in numerical order are ready at all times, corresponding to the measurements of the plungers, and by trial one is able to select the die and the plunger that is to strike up the blank. The root is trimmed to receive the cap, and an impression and bite is taken. This is mounted on an articulator and a model is prepared by trimming the margins. A wire measurement is then taken, either by trial in the mouth or on the model. The number of the wire measurement determines the size of blank to swage on the press. The same number corresponds to the die that is used to strike the cusp. A blank with cusp already struck up is then tried on the model, the distance from the cervical margin is marked with a pair of dividers, and a parallel line drawn to cut off the irregular edges. It is then articulated, and any alteration in the cusp can be made by tapping with a blunt instrument. It is then contoured by means of pliers, and filled and polished, holding the cap when polishing with the same die that made the cusps.

Dr. W. H. Bohn, Reading. "Insertion of a Labio-Cervical Porcelain Filling."

Before starting to prepare the cavity, make a copious application of a ten per cent. solution of cocain to the gum at the cervix. Make a slight incision in the gum tissue, in the center, so as to form two flaps, in order to prevent the bruising of the gum tissue during the burnishing of the platinum matrix. Any hemorrhage can be readily checked with a solution of adrenalin chlorid. The cavity is then prepared in the usual manner. A piece of 1/1000 platinum is then cut the proper width to cover the full length of the tooth. The cervical end is trimmed to an oval shape, and this is burnished with the fingers over an S. S. W. cone-socket handle No. 11, which produces such a shape as to permit its free admission under the gum margin. Work the platinum well into the cavity with wet cotton pellets; then press the long end of platinum on the tooth, and secure it firmly by pressing a narrow but very heavy rubber-dam strip over and in between the adjoining teeth. The rubber should be about four times as heavy as the ordinary heavy rubber dam. This locks the matrix to such an extent that a free and exact burnishing can be done without any danger of distorting the matrix. After the matrix is obtained, I use S. S. W. enamel for the base, and Brewster's on the surface. The inlay is set with Ascher's artificial enamel. Use nothing but an ivory spatula to mix the cement, as a steel instrument will discolor it.

Dr. W. H. Neall, Philadelphia. "A Demonstration of Old-fashioned Hand-carved Teeth."

The object of Dr. Neall's clinic was to show how handy our old dentists of a half-century ago were, in making the gold plate and the teeth to go upon them. The plates exhibited were of gold, with porcelain-backed teeth riveted upon them. The gold was refined by my father and grandfather, rolled out, and made into plates. The mineral bodies were ground and prepared, carved into shape, baked, and finally fitted upon the previously made gold plates. The object of the clinic was simply to contrast the ease with which in the present day dental operations are carried out, with the immense amount of labor necessary years ago. The clinician also exhibited about two or three hundred carved blocks ready for mounting; also about four or five hundred so-called pivot teeth. He also exhibited some of the first pieces of continuous gum work ever made.

Dr. STEPHEN PALMER, Poughkeepsie, N. Y. "Porcelain Art."

(1) Immediate correction of irregularities by aid of porcelain veneers. This phase of the clinic was illustrated by plaster casts of the case before treatment. Each step taken was carried to completion, and the finished case was shown by a typical one and a veneer fitted to a prepared mounted natural tooth.

(2) The repairing of fractured teeth of a continuous-gum denture. The central and lateral incisors were fractured diagonally, and the original length and contour were restored by building up with inlay material, which was subsequently baked, in that way saving the expense, time, and risk of removing the fractured teeth and replacing them with new ones.

(3) Construction of a porcelain-post crown upon an irregularly broken-down root, the fracture being well under the gum margin, where it would be impossible to insert a Logan or other manufactured crown. This method avoids the sacrifice of either a perfect central or canine for supporting a bridge.

(4) A crown constructed over a remaining post of a fractured crown, previously inserted, thus avoiding the removal of the post, which operation often weakens the root.

(5) Porcelain veneers as used to restore uniformity of shade of two conspicuously discolored teeth. Illustrated by plaster casts, showing the preparation of the teeth, the constructed veneers before being cemented in place, and the completed case. The result can only be appreciated when the satisfactory appearance is noted in the mouth.

(6) Several samples of inlay and crown construction which illustrated the extensive use of porcelain, which has proved satisfactory beyond expectation, and which has further served to prove that porcelain is a necessity in dentistry.

Dr. WM. MIDDLETON FINE. "Method for Producing the Natural Contour of Artificial Teeth on the Lingual and Palatal Surfaces of Artificial Dentures." [See page 551 of the present issue of the COSMOS.]

Dr. A. H. MCPHERSON, Philadelphia, gave a demonstration of an apparatus for the removal of pus by electrolysis.

Dr. H. W. WESTON, Torresdale, gave a demonstration of making cast plates, using Weston's metal.

Dr. ROBERT BREWSTER, Chicago, Ill. "Constructing Porcelain Inlays with a View to Overcoming Shadows." Dr. Brewster's clinic consisted in swaging platinum matrices; building the inlay with matrix lining, yellow foundation body, and finally enamel body. The fusing was done in the Roach automatic furnace, the result being a beautifully fused and perfectly shaded inlay.

THE DENTAL COSMOS
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Devoted to the Interests of the Profession.

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PHILADELPHIA, MAY 1906.

EDITORIAL DEPARTMENT.

WHO IS MY BROTHER?

PERHAPS the greatest calamity in the world's history—certainly the greatest calamity of modern times—has been visited upon the city of San Francisco, which has been practically destroyed by earthquake and the subsequent holocaust which the inhabitants were powerless to combat because of the destruction of the water service. Homeless, without food and shelter, all their earthly possessions annihilated, many thousands of her citizens are suddenly forced to look to their more fortunately situated brethren for the means of subsistence—for the necessities of life.

The appeal has gone out from sympathetic hearts all over this broad land of ours for a general effort to help these people in their awful distress. Anything that anybody can do or contribute now is needed and will be welcome. Among the more than five hundred dentists of San Francisco it is reasonably certain that many have suffered loss of property and the means of livelihood equally with other citizens of the stricken city. As members of a profession united by common interests and aspirations, let us remember that our first duty is toward those who are of us—of our own profession. Doubtless this same thought is uppermost in the minds of many, and we trust it may be general and may bear abundant fruit.

That contributions may be made available with as little delay as possible, the DENTAL COSMOS will cheerfully act as temporary custodian of any fund which may be raised by voluntary subscription until an organized movement can be set in motion having for its object the relief of our suffering brethren. We hope that all dental journals will take the same action and give aid and furtherance to the collection of a substantial sum to be disposed of by a properly constituted National Committee for the relief of the dentists who have been destituted by the San Francisco calamity. We would suggest that Drs. V. E. TURNER of Raleigh, N. C., treasurer of the National Dental Association, JAMES TRUMAN of Philadelphia, G. V. BLACK of Chicago, and J. D. PATTERSON of Kansas City, be constituted the National Committee to act as custodians of the general fund, to be then transferred to a local committee having power to act with reference to its distribution.

Chicago dentists with characteristic humanity and promptness held a meeting on Friday evening April 20th, two days after the news of the San Francisco calamity, and raised over two thousand dollars, of which amount one thousand dollars has already been sent to California. This meeting named the following committee: L. L. DUNBAR, WILLIAM SHARP, JAMES SHARP, HARRY P. CARLTON, L. VAN ORDEN, A. E. BAER and J. C. POST—a representative body of California men, to which we think should be added the name of JOHN S. MARSHALL, to constitute a local committee for the disbursement of the fund to be collected by a National Committee as already suggested.

A meeting of dentists in Boston has been held, and a considerable sum was subscribed on the spot. The secretary has wired their approval of the plan of relief organization here outlined. Through the initiative of the editor of the *Items of Interest* all members of New York dental societies are in receipt of a circular request for contributions, and a plan for an organized relief movement is in operation in that state.

Pennsylvania is at work to the same end, as doubtless are other states.

Now is the time to act, for it is the time of direst need. Now is the time above all others for the dental profession of America to demonstrate the extent of its fraternal feeling by a concerted effort to help our stricken brethren. Send on your contributions at once; give liberally; don't wait to find out what someone else is going to do, but do it now, and do it generously.

We shall keep our readers informed of the progress of the movement and of the results attained.

BIBLIOGRAPHICAL.

ORTHODONTIA; OR, MALPOSITION OF THE HUMAN TEETH: ITS PREVENTION AND REMEDY. By S. H. GUILFORD, A.M., D.D.S., Ph.D., Professor of Operative and Prosthetic Dentistry in the Philadelphia Dental College. Philadelphia: Press of T. C. Davis & Sons, 1905.

This—the fourth edition of Dr. Guilford's work—with the exception of the chapters on the "Physiology of Tooth-Movement," "Dynamics," and part of the chapter on "Etiology," has been entirely re-written, the new product embodying the latest and most practical thoughts not only of the writer, but likewise of the host of investigators and teachers in the special field of facial and dental orthopedia.

The book is divided into three parts entitled respectively, "Principles," "Practical Considerations," and "Classes of Irregularities and Practical Treatment." In Part I a new chapter on "Facial Harmony and Occlusal Relations" has been added, while Part II has been enlarged by the addition of two important chapters, one on "Materials and Construction of Appliances," and the other an "Outline of College Technique Course."

A careful perusal of the work will invariably reveal the fact that it is written by a teacher, one familiar with the difficulties encountered by beginners, and sympathetic in his helpful attitude toward the inexperienced ones in this special field of work. Consequently, and as might be reasonably expected, the author presents his subject in a style the comprehensiveness and simplicity of which will materially help the student in acquiring a wide range of fundamental knowledge in orthodontia.

The book, which is already well known as a valuable contribution to the subject of which it treats, will doubtless occupy a still more prominent position in the future, because of the valuable additions to which we have already made reference, and also by reason of the fact that in the revision the author has omitted no effort to place the book upon a level in harmony with the important rôle which orthodontia is called upon to play in the practice of dental surgery.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by **JULIO ENDELMAN, D.D.S.**

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde,* Zurich, January 1906.]

ALOPECIA AREATA OF DENTAL ORIGIN.

By Dr. H. Allaeys, Antwerp, Belgium.

In this interesting article the author endeavors to prove that alopecia areata, contrary to the views of such distinguished dermatologists and investigators as Hallopeau and Leredde, is not a disturbance of microbic origin, but to all appearances a manifestation of a neurosis of trophic nature. The latter theory is energetically defended by Duhring of Philadelphia and by Kaposi of Vienna, who believe that the reason why the circumscribed form of alopecia has been attributed to an infectious origin is because it has been confounded with a number of diseases, such as lupus, chronic folliculitis, etc. According to Jacquet, who has made a profound study of this question, the circumscribed form of alopecia is the result of a trophoneurosis induced by some error of metabolism. It frequently happens after disturbances in the region covered by the trifacial, and there unquestionably exists a chronological relationship between the onset and development of gingivo-dental lesions and the appearance of the bald areas.

Jacquet, in support of this theory, has collected and published a series of thirty-six cases of circumscribed alopecia caused by the following dental lesions: Alveolo-dental periostitis, 1 case; simple odontalgia, 4 cases; fistulæ, gingival abscess, periradicular gingivitis, 3 cases; extractions, 5 cases; painful caries, 9 cases; difficult dentition, 14 cases. It has likewise been found that cases of alopecia areata are more frequent during the periods embracing the evolution of the deciduous and permanent dentitions, the greatest number of cases occurring during the periods between seven and fourteen years, and between twenty and thirty years. The depilated areas are usually located upon the region supplied by the branches of the superficial cervical plexus.

Reflexes of gingivo-dental origin would travel upon a direct path formed by the dental branches—the superior maxillary division of the trifacial in the case of irritation in the maxilla and the inferior dental nerve in the case of irritation in the mandible, the Gasserian ganglion, the sensory root of the trifacial, and the deep origin of the latter in the medulla, the gray matter, and the origin of the cervical nerves. The author concludes the article with the description of a case of circumscribed alopecia in a man aged twenty-five, caused doubtless by a trophoneurosis of gingivo-dental origin. The patient had for many years suffered from chronic gingivitis, caused by excessive tobacco-chewing, the irritation to the gums being in addition further intensified by reason of the patient's pernicious habit of constantly keeping a bolus of triturated tobacco upon the right side of the lower vestibulum oris. The depilated areas, which were located in the suboccipital region, appeared some time after the patient had acquired the "chewing" habit, and had resisted treatment for a period of thirteen years.

Dr. Allaeys' treatment consisted in placing the mouth in a thoroughly hygienic condition, in causing the patient to abandon completely the tobacco habit, and in washing and brushing the depilated areas with soap and water three times a day. The ninth week after the beginning of the treatment, hair began to make its appearance in spots, and in about six months' time the areas had become entirely covered.

[*Deutsche Zahnärztliche Wochenschrift,* Berlin, April 7, 1906.]

FETOR OF THE BREATH. By Dr. J. F. Schilling.

The author (*Wiener med. Presse* 1905, No. 5) discusses the etiology of fœtor ex oris, and recommends that every organ of the body be carefully examined to ascertain the source of contamination of the expired air and in order to institute such rational treatment as may effectively eradicate the direct cause of the disturbance, whether superficial or deep-seated. The examination should begin in the mouth, and if it be found that the teeth are sound, that the mucous membrane is not the seat of ulcers, aphthæ, or other infectious inflammations, the examinations should be proceeded with in the direction of the pharynx and naso-pharynx, which may be the seat of inflammatory swellings of syphilitic origin, of catarrhal inflammation, of disturbances due to empyema of the antrum, etc. An offensive breath may be also caused by pulmonary diseases, such as tuberculosis, purulent bronchitis, or by disturbances of the stomach and intestines. Chronic constipation is frequently the cause of fœtor ex oris, but the breath becomes odorless immediately after the expulsion of the fecal matter from the intestinal tract. Although the author does not mention them, prosthetic apparatus—especially those imperfectly constructed—are often the cause of fetor of the breath; a possible cause which should not be disregarded either by the physician or the dentist.

Dr. Schilling recommends a local treatment, consisting in gargling the mouth with a weak thymol solution, a three per cent. solution potassium chlorid, or a 1:1000 solution of potassium permanganate.

The following prescription, recommended by Truman of Philadelphia, is in the reviewer's opinion an excellent oral deodorant:

℞—Hydronaphthol, gr. xv;
Alcohol, ℥j;
Distilled water, ℥j. M.

Sig.—One teaspoonful in a tumbler of water.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde*, Zurich, January 1906.]

VOLUMINOUS CANCROID OF THE CHEEK.

By Dr. H. allaeys, Antwerp, Belgium.

Dr. Allaeys describes the case of a patient aged forty-six, who sought his services for the treatment of a large tumor upon the mucous membrane of the cheek of about one and a half inches in thickness, and extending from the right third molar to the labial commissure of the same side and from the roof of the vestibule to a short distance below the occlusal curve. The tumor was painless, bled easily, its surface was decidedly irregular and in form resembled a cauliflower. Its removal having been decided upon, the operation was performed through the mouth, and instead of excising it with the cutting instruments ordinarily employed for that purpose, it was detached from the tissues of the cheek by means of the thermo-cautery. The hemorrhage was very slight, and the recovery was an uninterrupted one. The tumor, which was of absolutely non-malignant character, was in all probability the outcome of a degree of irritation, slow but continuous in character, and as all the teeth were perfectly sound, the conclusion was reached by the author that the chewing-tobacco habit—to which the patient was strongly addicted—was the responsible factor in the case. In concluding, the author strongly urges his *confrères* to operate through the mouth when at all possible, in order to prevent the disfigurement of patients, which in many cases might have been avoided by a judicious discrimination between the two ways of operating, viz, through the mouth and through the external structures.

[*Archiv für Zahnheilkunde*, February 1906.]

ACUTE POISONING WITH TINCTURE OF IODIN.

By Professor Adolph Witzel, Bonn, Germany.

The author has upon previous occasions called attention to the injurious results that may follow the injudicious application of tincture of iodin upon the oral mucous membrane, and has warned dentists to refrain from directing patients to use the preparation at home—for as in the case to be described, it may result in severe inflammatory complications of the mucous membrane, pericementum, and even deeper structures.

The case which came under the author's observation, and which is the *raison d'être* of the present article, was that of a woman who, having suffered several days previously from a severe pericementitis, was ordered by the family physician to apply tincture of iodin upon the gum tissue over the affected tooth (the upper left second molar), and to seek at once the services of a dentist. The pain subsided partially after the first application, but as the patient was naturally anxious that it should entirely disappear, the iodin treatment was continued, with the result that in the space of three days the gum tissues received eight iodin applications. Several days afterward, when the patient called on Professor Witzel, the gingival mucous membrane from the upper left second bicuspid to the uvula was the seat of severe inflammatory phenomena. The tissues were of a yellowish color, and having become separated from the underlying osseous structure had assumed a characteristically shredded appearance. Tincture of iodin—as the author well remarks—is a valuable agent when used with caution in those conditions in which the employment of an effective counter-irritant is indicated, but to direct patients indiscriminately to apply iodin whenever pain about the mouth appears is a method of practice to which practitioners should not adhere, for the reason that it may result, as in the case under consideration, in severe injury to the patient. The iodin applications should be made by the dentist and not by the inexperienced patient.

[*La Estomatologia*, Bilbao, March 1906.]

POST-EXTRACTION TREATMENT OF THE ALVEOLI. By Ramón Pons, Barcelona, Spain.

The author recommends a number of formulæ for the treatment of painful alveoli. For irrigations of the alveoli either one of the following prescriptions may be employed:

No. 1.

℞—Carbolic acid crystals,	gr. xv;
Chloral hydrate,	gr. xv;
Peppermint water,	℥iij.

No. 2.

℞—Tincture of rhatany,	gr. lxxv;
Tincture of opium,	gr. xv;
Distilled water,	℥iij.

No. 3.

℞—Distilled water,	℥vj;
Spirits of Camphor,	ʒij;
Glycerin,	ʒij;
Creasote,	gr. vij.

No. 4.

℞—Boric acid.	ʒj.
Chloroform,	gr. xv;
Distilled water,	℥iij.

For dressing the alveoli either one of the following preparations may be employed:

No. 1.

℞—Iodoform,	gr. vij;
Menthol,	gr. vij;
Tannic acid,	gr. xv;
Cocain hydrochlorid,	gr. iij.
Tincture of Benzoin,	ʒiij.

No. 2.

℞—Cocain hydrochlorid,	gr. iij;
Chloral hydrate,	gr. xv;
Glycerin,	ʒj;
Alcohol,	q. s.

No. 3.

℞—Alcohol,	ʒiij;
Chloroform,	ʒvi;
Ether,	ʒj;
Camphor,	ʒj;
Tincture of opium,	gr. xxx;
Oil of cloves,	gr. xv.

[*Dental Brief*, Philadelphia, April 1906.]

THE ANESTHETIC PROPERTIES OF MAGNESIUM SULFATE. [Editorial.]

Anesthesia with magnesium sulfate can be obtained either by subcutaneous, intraspinal, or intravenous injection, the latter method, however, being too dangerous for practical use. In the surgical tests the intraspinal method was adopted. The average dose given was about sixteen minims of a twenty-five per cent. solution for each twenty pounds of body weight of the patient. This dose was given after the removal of an equal amount of cerebro-spinal fluid by lumbar puncture. The full effect of the drug is not immediate, and the best time for operating was found to be about three or four hours after the intraspinal injection. The anesthetic effect is quite prolonged, sensation and motion not returning until from eight to fourteen hours after the administration of the drug. In the first few cases a little chloroform was given, but greater experience showed this to be unnecessary, and full anesthesia was induced by magnesium sulfate alone.

The experiments thus far conducted show that the dangers of anesthesia with magnesium sulfate are practically only from respiratory depression, the heart and pulse remaining normal. In one case in which by mistake an overdose was given, the patient is reported as having passed into a deep general anesthesia in which he remained for about five hours, the pulse varying between seventy and eighty during the entire time, while respiration fell to ten per minute. In cases in which such an emergency arises, Dr. J. S. Meltzer, the discoverer of the anesthetic properties of the salt under consideration, deems such methods of artificial respiration as those of Silvester, Howard, or Laborde as absolutely insufficient, and urges as essential to safety intra-laryngeal insufflation with the Fell-O'Dwyer apparatus, by which air is pumped into the lungs by means of a foot bellows attached by a suitable pipe to a long intubation cannula fitted with a conical tip, of which there are a series suited for various ages, each tip being so designed that it will readily wedge itself into the glottis, and thus prevent air from escaping between it and the laryngeal wall.

Dr. Meltzer's experiments show that the direct local application of magnesium sulfate to a nerve trunk abolishes its conductivity, "in this respect acting like the local application of cocain," which result might suggest the possibility of employing it as a substitute for cocain in dental practice. It, however, does not follow that an agent which when applied to a nerve trunk will abolish its conductivity and excitability, or which when absorbed in sufficient volume will narcotize the nerve centers, will have the same effect when applied to peripheral nervous filaments. As a matter of fact, by actual test, a simple hypodermic injection of magnesium sulfate has not been found to diminish—to any appreciable extent—the sensitivity of the area around the puncture. It is the opinion of the author of this article, that whatever may prove to be the practical utility of magnesium sulfate as a systemic anesthetic in general surgery, there is no present evidence that it can be made available for purely local effect in dental practice.

[*Dental Brief*, Philadelphia, April 1906.]

SOLIDIFIED FORMALDEHYD IN THE TREATMENT OF PUTRESCENT PULPS.

By P. P. Dorr, Fort Dodge, Iowa.

After having used solidified formaldehyd in the treatment of putrescent pulps and incipient abscesses for a period of about ten months, covering several cases of each class, I have arrived at the conclusion that it is by far the most potent remedy of which I know for these cases, and can therefore heartily recommend it. The various medicaments and treatments suggested and recommended from time to time have all been tried, but in my hands they are not so successful as solidified formaldehyd. The *modus operandi* is as follows: Open the pulp-chamber, clean out as much of the débris as possible, syringing frequently with tepid water, taking care not to enter the canals.

After having broken the solidified formaldehyd into small pieces containing approximately from one-twelfth to one-fourth of a grain each, dry the cavity, place a piece into the pulp-chamber, cover with a small pledget of cotton, and seal with temporary stopping. There is sufficient heat and moisture in the substance of the tooth to liberate the formaldehyd gas. I much prefer temporary stopping to cement for sealing the cavity, for the reasons—first, because of its easy removal, and second, because it is not porous, thus confining and forcing the formaldehyd gas into the root-canals, where it thoroughly sterilizes every vestige of dead pulp tissue remaining, together with the walls of the canals to the very apices, thereby eliminating all danger of infection of the periapical region.

In lower teeth with large canals, I first place over the orifice of the canals a few fibers of cotton, to prevent any little particles which may accidentally break from the larger piece from entering the canals while pressing in the temporary stopping. In some cases of large multi-rooted teeth with canals far apart, I place a small piece at the orifice of each canal rather than use one large piece. I have had cases of severe infectious peridental inflammation where it was impossible to open into the pulp-chamber, owing to the existing tenderness, which was completely relieved in from one to two days by simply placing a piece of solidified formaldehyd in the portion of cavity in close proximity to the pulp-chamber, and sealing with temporary stopping. In such a case, after the inflammation has subsided, it is well to open the pulp-chamber and proceed as with a putrescent pulp, sealing in another dressing for twenty-four hours or longer. It may be made to remain in the tooth in cases of putrescent pulp for from twenty-four hours to a week or ten days, or even longer, without injurious effects. After twenty-four to forty-eight hours, on its removal there will be found no evidence of putrescence and no tenderness on percussion. The canals may then be cleansed and permanently filled.

[*Le Laboratoire*, Paris, March 1906.]

METHOD OF OBTAINING PLASTER CASTS OF THE FACE. By M. L. Gatineau.

After placing the patient in the dorsal decubitus, protect the hair by wrapping a napkin around the head. The face is now covered with a layer of vaselin, which should be carefully applied upon the eyelashes and eyebrows in order to thus avoid every possibility of the plaster adhering to those structures. The plaster should be dissolved in a solution composed of water 1000 gm. and sodium chlorid 60 gr. After thoroughly incorporating the plaster in the solution, carefully cover the face with a thin layer of it, which, however, should not be made to occlude the nostrils, as otherwise the patient would be prevented from breathing. As soon as the plaster begins to set, apply upon the nostrils a piece of softened wax, and almost at the same time remove the impression. The latter becomes detached without any difficulty whatever, but it should be handled carefully, for the reason that it readily breaks owing to its extreme thinness. Prior to the pouring of the cast the impresssion should be treated with a solution of soap made by dissolving 250 gm. of soap in 1000 gm. of boiling water. About four ounces of the soap solution are poured into the impresssion and by means of a camel's-hair brush it is made to penetrate into every crevice of the impression. The remainder of the solution is now poured off, and upon the surface thus treated a thin layer of oil is applied, this additional precaution being employed in order to facilitate as much as possible the separation of the impression from the cast. A small quantity of plaster is now poured into the impression, and with the aid of an appropriate brush is made to penetrate into every irregularity and depression of the impression. An amount of plaster sufficient to produce a cast three-quarters of an inch in thickness is now added. The separation of the cast from the impression should not be attempted until every sign of heat evolution has ceased.

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PERISCOPE.

Advantage of the Gold Inlay over the Porcelain One.—The gold inlay has one marked advantage over the porcelain in that the matrix becomes a part of the inlay, giving it an exact fit to the cavity, therefore requiring the minimum of cement.—Joseph W. Wassall, *Items of Interest.*

Temporary Dentures.—We cannot place in the mouth a temporary denture quickly enough after the removal of the teeth. I am so radical in my belief that I advocate making a denture before the extraction of teeth in a great many cases, so that after the extraction has taken place the denture can at once be put in position. This not only restores the lost teeth, but the denture acts as a splint to encourage the rapid healing of the wounded parts.—W. M. Bartlett, *Western Dental Journal.*

Obtunding Sensitive Dentin.—Moisten the cavity freely and place in it a bit of solid sodium dioxid, allowing a drop of water to fall upon it. A brief moment of pain follows, after which the excavation may be proceeded with almost painlessly. For deeper work a second application may be necessary; usually with no pain at all.—E. M. Soule, *Items of Interest.*

Carbolic Acid for Cleaning Cavities.—Wiping a cavity with an alcohol-saturated solution of carbolic acid to ascertain the extent of the decay in the fissures of molars and bicuspids—while in the course of preparation—will show very clearly whether all carious tissue has been excavated and will bring out in relief, so to speak, some crevice that might otherwise possibly be overlooked.—*Dentist's Magazine.*

Burs and Mandrels and How to Care for the Handpiece.—Keep a small jar of vaselin convenient in which to dip the shanks of burs and mandrels before putting them in the handpiece. It insures easy working of the handpiece, and prevents the ingress of moisture.—R. H. Manning, *British Dental Journal.*

To Relieve the Strain on the Porcelain While Backing Teeth.—Cut a spur with a sharp knife in the platinum pins, and turn these spurs down against the backing, instead of bending down the whole pin. This relieves the strain on the porcelain and lessens the danger of checking the facing.—V. M. Robinson, *Western Dental Journal.*

The "Cry of Tin."—Tin possesses a crystallized structure, and can be obtained in well-formed crystals of the quadratic system. On account of this crystalline structure, a bar of tin, when bent, emits a creaking sound termed the "cry of tin." The more nearly the tin approaches purity the more marked the cry.—H. L. Ambler, *Dentist's Magazine.*

To Diminish the Sensitivity of the Palate prior to the Taking of Plaster Impressions.—In prosthetic work, when your patient has a tender palate and is bothered with retching, to stay such trouble while taking an impression, paint on the palate a twenty per cent. solution of potassium bromid with a camel's-hair brush, or direct the patient to gargle with a solution containing from 5 to 15 gr. of the salt, or both. In extreme cases give internally 10 gr. at night, repeat after breakfast, and again one-half hour before the impression is taken, give 10 to 15 gr. It greatly diminishes the sensitivity of a tender palate.—H. E. Davis, *Dental Review.*

Iodin as a Germicide.—In a solution of iodin varying from 0.2 to 1 per cent., we have a very potent germicidal agent, far superior to mercury bichlorid, the acknowledged leader of all other antiseptics. It approaches nearly to the ideal antiseptic in that—(a) It is easily prepared and is stable; (b) it is non-toxic and non-irritating in the strength effective, being only one-fourth as toxic as mercury bichlorid; (c) it does not coagulate albumin or form inert compounds with tissues; (d) it is effective in a very brief time; (e) the stain it produces soon disappears; (f) last and most important, it possesses a remarkable penetrating power. A 0.5 per cent. solution is amply strong enough for all practical purposes.—*St. Louis Medical Review.*

Thrush or Sprue.—The following combination is of value:

℞—Sodii hyposulph.,	ʒiij;	
Glycerin,	ʒiss;	
Aq. q. s. ad	ʒij.	M.

Sig.—Apply locally on a piece of absorbent cotton or antiseptic gauze.

It will do no harm if the infant should swallow any of the solution. Sodium hyposulfite is also of service as an antiseptic when sarcinæ are present, with vomiting:

℞—Tinct. gentianæ comp.,	ʒij;	
Tinct. capsici,	ʒ½;	
Sodii hyposulph.,	gr. xl;	
Spir. chloroformi,	gtt. vj;	
Aq., q. s. ad	℥viii.	M.

Sig.—Two tablespoonful t. i. d.
—*Monthly Cyclopedia of Pract. Medicine.*

Inlays Immune to Decay.—The inlay offers greater immunity to recurrent caries by virtue of its sealed cemented joint between filling and cavity wall. In the gold foil plugger-made filling, no matter how skilled and conscientious the operator, how perfectly the cavity is formed, how far extension for prevention is carried, however well the gold is condensed and adapted, what time and labor are spent in every detail, there still remains after completion a filling without adhesion, with an open joint between gold and tooth-structure. In some portions of the cavity wall this joint—in good hands—is microscopical; in other portions we all know that it is at times an appreciable space. In all cases it is an actuality—a mechanically and physically demonstrable fact of each case. This space between cavity wall and filling undeniably exists, and persists as a constant menace. It is the vulnerable point, and if caries recommences it will almost invariably be at some point of juxtaposition of gold and enamel.—Joseph W. Wassell, *Items of Interest.*

Preparation of Plaster Cast and Impression Prior to Waxing-Up.—The rule is, whenever the tissues are hard, carve the impression sufficiently to just clear the plate from pressure upon them when in use. Where the tissues are soft, carve the cast until the soft tissues are compressed, to render the plate immovable upon the hard tissues.

Carve the upper side of projections sufficiently to prevent the air from entering beneath the plate when it has settled firmly into position. The same result may be obtained by building up the cast with air-chamber material where the impression is trimmed.

Whichever method is employed the principle involved is the same and like results must follow. The practitioner must not expect a complete success at the beginning, for only by practice can he acquire the necessary skill to compensate him for his earnest efforts.

I have used this method for years, and can assure to all who may adopt it, and apply it with good judgment, success in making artificial dentures that will gratify both patient and dentist beyond their greatest expectations.—FRANK C. BLIVEN, *Items of Interest.*

Diagnosis of Incipient Pyorrhea.—One thing necessary (besides the painstaking explorations along gingival margins) on the part of the dentist, is to press the finger on the gums well up, and bring it to the gingival line, when not infrequently a thin line of pus will show a diseased condition, perhaps not otherwise suspected.

When this condition is found the patient cannot remedy it, but may be helped materially under the dentist's advice. Here we have a pocket, without as yet much absorption of tissue, and a blunt probe or the blunt point of an abscess syringe will not readily enter it. It should be washed out, however, using a hypodermic syringe with curved needle, or a small round blunt point may be inserted by first stretching away the gingiva by the insertion of a thin point. After washing out with warm cinnamon water or a considerably diluted solution of hydrogen dioxid—say one per cent.—other healing and stimulating remedies may be applied by the use of thin splints of sterile orange-wood or pieces of quill. The nature of the patient's co-operation in the treatment is to use antiseptic and stimulating washes, to faithfully keep the teeth clean, to massage the gums as the dentist directs, and to keep appointments faithfully for such treatment as the latter must give personally.—R. B. TULLER, *American Dental Journal.*

"Bulk" Shading vs. "Layer" Shading.—The mixing of colors to obtain an accurate shading of inlays is being worked upon a very indefinite basis. It lies within the scope of a very limited few to be able to take a little of the foundation color and add it to one of the other shades to reproduce any desired color. It is a quicker and more exact method to mix the shades, taking a portion of any two or more bottles, thoroughly macerating and blending them by passing the powders through sieves, and after placing the mixed bodies in a bottle, to then bake a portion of it into a button. This button will represent the exact shade that may be obtained from the combination of the powder in the bottle. With this sample shade one can match the color wished and be sure of reproducing it. This method will give an unlimited number of colors from which to chose the shade desired, but to mix different colors to match a certain shade possesses an element of uncertainty which only a few can overcome.—ARTHUR E. PECK, *Dental Review.*

Treatment of Chronic Alveolar Abscess through the Alveolar Plate.—I believe if we cannot get results in two or three treatments we are justified in concluding that there is trouble around the end of the root, which we will not be able to properly handle through the pulp-chamber. In such cases I prefer to fill the root-canal, and if necessary make an opening through the alveolar process. I believe it is a mistake to carry a tooth along, giving weeks and weeks of treatment through the pulp-chamber; and many of us make a mistake in treating such teeth too often. Unless something calls for it we ought not to treat a tooth through the pulp-canal oftener than once a week. Whenever an abscess forms about a root, it nearly always surrounds the apex of the root. It destroys the peridental membrane around the sides of the root, consequently treatment through the root-canal does not accomplish the desired results; after pus has been present for a long time—if the surface of the root has been bathed in pus for many weeks—we shall get satisfactory results from treatment through the pulp-chamber in but very few cases. I have not practiced immediate root-filling in such cases, but I have done it "more immediately" than is the general custom.—ARTHUR D. BLACK, *Dental Review.*

Symptoms of Alveolar Abscess; Constitutional and Local.—Every case in alveolar abscess begins with an inflammation of the apical portion of the peridental membrane, following immediately, or more or less remotely, the death of the pulp of a tooth. If acute, there is severe pain and soreness of the tooth. In most cases this is accompanied by a lymphangitis in which the lymphatic glands of the floor of the mouth, the submaxillary lymph glands, and those of the angles of the neck are more or less involved. Generally pus forms about the apex of the tooth promptly, and more or less absorption of bone in the immediate neighborhood takes place quickly. During this process a sharp rise of temperature occurs, often preceded in severe cases by a chill. The severity of these symptoms gives indications of the probable evil results that are to follow. It is well at this time, if the symptoms are severe, to look carefully to the general condition of the patient, particularly to see that the circulation is good, and that the alimentary tract is in good condition.—G. V. BLACK, *Northwestern Dental Journal.*

A New and Valuable Method of Making Matrices.—I recently received from Dr. Emil Schreier of Vienna a suggestion which after trial I unhesitatingly pronounce to be one of exceeding value in the technique of all kinds of inlay fillings. There can be no doubt that the stability of an inlay is much enhanced by the depth to which it may be introduced into the cavity. Heretofore, in very deep cavities it has been necessary to lessen the depth by a strata of cement or other material. Dr. Schreier suggests the use of what is known as goldbeaters' skin. This is an exceedingly thin, bladder-like material that goldbeaters use when beating the metal into foil to avoid tearing.

In making a matrix the goldbeaters' skin is placed on the under side of the foil and therefore next to the cavity walls. With ordinary care the gold can thus be forced to a very considerable depth without tearing. After the edges are thoroughly burnished the goldbeaters' skin is easily removed, and the matrix can be returned to the cavity for a final adaptation to the walls. In the production of either porcelain or gold inlays by the so-called impression method, the goldbeaters' skin is of equal value, as the matrix material can be forced into deeper grooves and undercuts without tearing than can be done without this protection, the skin acting as a cradle to support the matrix while it is being carried to place.—R. OTTOLENGUI, *Items of Interest.*

Removing Pins from Roots.—When a case presents itself where a Logan or other pin crown has broken off, leaving the pin embedded in the root, difficulty is often experienced in removing it; so much so, that in two cases under charge of an experienced prosthetic operator, which came under my notice recently, the loss of the roots resulted. The method taught years ago was to bore alongside and around the pin with a small bur—to the great detriment and breakage of burs—until the end of the pin was reached, taking care to run the bur against the pin in order to as far as possible avoid boring sound material away and the often occurring danger of perforation. This required abundance of care and time; but progress could sometimes be made by the plan of boring on one side only, and then pushing the pin in that direction, thus losening it. When an entire Logan pin, or enough to be grasped, is left projecting from the root, it can be removed by means of a pair of pin-pulling pliers. If, however, the pin is broken flush with or below the root-end, about the best and speediest way is to use an S. S. W. trephine No. 253, which will encircle the pin and cut out the cement around it, the pin acting as a central guide to prevent the trephine going to one side and damaging the root. While using the trephine care is necessary to avoid breaking it by sudden side strains, or allowing débris to clog it. The latter may be avoided by removing it two or three times to expel the cuttings. This method should remove all pins of ordinary length; but as the ways of some dentists are past accounting for, some extraordinarily long pins are met with, to the end of which the trephine (which would be much more useful if longer) will not reach. In such cases it will be necessary in addition to try to loosen it by shaking supplemented by boring—when necessary—with a bur at one side, as mentioned above. It is questionable, however, whether it would not be better in such a case to allow the pin to remain, and equip the new crown with a stiff tube of the same bore as the trephine, instead of a pin. A crown thus fitted is strong and can be cemented very satisfactorily. Of course, also, in some cases where a projecting pin is left it might be better to place a Davis or other detachable crown on it than to pull it out.—THOS. J. MCGERNON, *Dental Hints.*

Tooth-Powder Ingredients and How to Test the Purity of Precipitated Chalk.—This substance takes its name from its formation as a precipitate when a hot solution of calcium chlorid has added to it a solution of ammonium carbonate. It owes much of its use in dentifrices to its entire freedom from grit. Although practically insoluble in water, it dissolves to some extent in saliva owing to the presence of carbon dioxid in this fluid. Most of the precipitated chalk on the market is pure, but occasionally it may contain ground gypsum (calcium sulfate), alumina, iron, barium carbonate, etc.

A simple but efficient scheme for examining a specimen of precipitated chalk for impurities is to dissolve the chalk in water by adding hydrochloric acid drop by drop, constantly stirring until a perfect solution is secured; then—(1) To some of the solution add barium chlorid solution, when gypsum if present would cause a precipitate. (2) To the chalk solution add ammonia and boil, when a turbid liquid or a precipitate would show the presence of iron, alumina, or phosphates. (3) To chalk solution add potassium sulfate solution, when any precipitate forming would show barium. (4) To chalk solution add fresh solution of hydrogen sulfid, when on standing corked for half an hour no color or turbidity of the mixture should appear, showing the absence of heavy metals.

A peculiarity of precipitated chalk is that although of soft character and entirely free from grittiness, yet under the microscope the particles are made up of rhombohedral crystals. Precipitated chalk is perfectly neutral in reaction, and does not alter on standing in air. In the prepared chalk of the U. S. Pharmacopeia we have a form of chalk that must not be confounded with precipitated chalk. This form of chalk, the prepared chalk, contains a larger proportion of mineral matter, iron, silica, etc., and for this reason is "gritty." Prepared chalk is more often adulterated with ground gypsum than the precipitated form, and may be appreciably colored as from iron. It should not be used as an ingredient of a dentifrice.

Chalk in tooth-powder constitutes the bulk of the mixed material; it acts as a mild non-irritating astringent, an excellent antacid, and an almost insoluble feebly abrasive agent.

Powdered orris root, a frequent constituent of tooth-powder, is the powdered rhizome of the Florentine iris. The rhizome has its outer covering removed when, after drying for several weeks, during which time a violet-like, odoriferous substance "irone" not originally present is formed, the dried rhizome is finely powdered. This slightly yellowish powder is soft, but from the presence of minute hard crystals of ammonium oxalate exhibits a considerable power of abrasion. The violet odor is persistent and constitutes a good agent for masking disagreeable odors of the mouth. The powder consists almost entirely of ovoid starch granules containing some tannic acid. Its particular action when incorporated in dentifrices is to stimulate the flow of saliva, act as a feeble astringent, exert mild abrasive action, and cover by an agreeable and lasting fragrance disagreeable odors from the breath. —HENRY H. BOOM, M.D., *Stomatologist.*

OBITUARY.

DR. CHARLES F. ALLAN.

DIED, suddenly, January 4, 1906, of cerebral apoplexy, at his home in Newburgh, N. Y., in the sixty-third year of his age, CHARLES F. ALLAN, D.M.D.

Dr. Allan was born November 2, 1843, in Cleveland, Ohio, where his boyhood was passed. After leaving the grammar school he became a student in the Central High School, from which he was graduated. In 1862 he volunteered his services in defense of his country, becoming a member of Company H, Eighty-third Ohio Infantry. After being mustered in at Camp Dennison he was sent to the front, being placed in the Army of the Tennessee. He was actively engaged in the manœuvers around Vicksburg, participating in the battles of Arkansas Post, Fort Gibson, Raymond, Jackson, Champion Hills, and Black River.

He was orderly-sergeant in the assault on Vicksburg, which city he entered July 4, 1863. On account of illness he was confined to the hospital for about eight months at Benton Barracks, and was then assigned to special duty in St. Louis, being thus employed until he was mustered out in the summer of 1865.

That same year Dr. Allan came to Newburgh and began the study of dentistry under his brother, Dr. George S. Allan.

In 1878 he attended the annual meeting of the Dental Society of the State of New York as a delegate, at which time he passed the examination of its Board of Censors, and had conferred upon him the degree of D.M.D.

As a practitioner Dr. Allan was conscientious and thorough in all of his work. He was earnestly interested in the deeper problems of his profession, and gave studious attention to its scientific development. Courteous, simple-hearted, and gentle in his demeanor, and was in all the relations of life the true type of Christian gentleman.

He was a member of the New York Odontological Society, of the Second District Dental Society, the American Dental Association, the New York Institute of Stomatology, and the American Medical Association, and was elected chairman of its Section on Stomatology for 1906.

Dr. Allan was one of those quiet, unobtrusive men whose energy and earnestness in the advancement of higher professional work never falter, and his influence for good, especially in connection with the associations in whose work he was more particularly interested, will be sadly missed.

He is survived by his widow—who was Miss Mary Crawford McCawly, to whom he was married in April 1881—and one daughter.

DENTAL LEGISLATION.

DENTAL LAW FOR THE PHILIPPINES.

AN ACT REGULATING THE PRACTICE OF DENTISTRY.

By authority of the United States, be it enacted by the Philippine Commission, that—

SECTION 1. The Commissioner of Public Health for the Philippine Islands shall appoint a Board of Dental Examiners for the Philippine Islands, with the advice and consent of the Board of Health for the Philippine Islands, consisting of three reputable practitioners of dental surgery, who shall be graduates in good standing of legally incorporated dental educational institutions recognized by the National Association of Dental Faculties and the National Association of Dental Examiners of the United States of America. They shall hold office for three years after their appointment, and until their successors are appointed and qualified: *Provided*, That the first appointees shall be appointed for a period of one, two, and three years, respectively, as specified in their respective certificates of appointment from the Commissioner of Public Health: *And provided further*, that no member of the faculty of any school, college, or university in which dentistry is taught shall be eligible for appointment on said Board. Each person appointed to the Board shall qualify by taking and subscribing the following oath of office:

"I, ..., having been appointed a member of the Board of Dental Examiners for the Philippine Islands, do hereby solemnly swear that I am a graduate in good standing of the .... at .... in the city of ...., that I will well and truly perform all the duties of said office, that I will faithfully account for all moneys coming into my hands as such officer, that I will bear true faith and allegiance to the Government of the United States, and that I take this oath without any mental reservation whatsoever. So help me God."

The oath shall be filed and recorded in the office of the Secretary of the Board of Health for the Philippine Islands.

The Commissioner of Public Health shall fill any vacancy that may occur in the Board within one month after the vacancy occurs. The person so appointed to fill a vacancy shall hold office only for the unexpired term of the member whose place he is appointed to fill.

The Commissioner of Public Health may, with the advice and consent of the Board of Health for the Philippine Islands, remove any member of said Board for continued neglect of duty or incompetency, or for unprofessional or dishonorable conduct.

SEC. 2. The Board of Dental Examiners shall appertain to the Department of the Interior, so far as executive action may be required in connection with it. It shall organize immediately after the appointment of its members, and annually thereafter on the anniversary of its first organization, by electing from its members a president, who shall be its chief executive officer, and a secretary-treasurer. It shall procure and keep a seal with which to attest its official acts. The members of the Board, except the secretary-treasurer, shall receive as compensation the sum of two and a half dollars each for each candidate examined for registration as doctor of dental surgery, and two dollars for each person examined for registration as *cirujano ministrante*. The secretary-treasurer shall receive compensation at the rate of one hundred and fifty dollars per year, one-half of which amount shall be paid on the thirtieth of June and one-half on the thirty-first of December of each year. The amounts due the members of the Board of Examiners for compensation shall be paid from insular funds and disbursed by the disbursing officer of the Board of Health for the Philippine Islands. The secretary-treasurer shall execute a bond for five hundred dollars, with good and sufficient sureties, which shall be approved by the Treasurer of the Philippine Archipelago, conditioned that he will pay to the Treasurer of the Philippine Archipelago all moneys received by him as treasurer, and that he will faithfully discharge all the duties of his office. He shall keep a record of the proceedings of the Board, and a register of all persons to whom certificates of registration as dental surgeons or undergraduates in dentistry have been granted under the provisions of this act, setting forth the name, age, sex, and place of business of each, his post-office address, the name of the dental educational institution from which he graduated or in which he studied, and the date of such graduation or term of study, together with the time spent by him in the study of dentistry, and the names and locations of all other institutions which have granted to him degrees or certificates of clinics or lectures in dentistry, medicine, or surgery.

Sec. 3. The Board of Dental Examiners shall meet in the city of Manila for the purpose of examining candidates desiring to practice dentistry in the Philippine Islands on the first Tuesdays of January and July of each year, after giving thirty days written or printed notice of such meeting to each candidate who has filed his name and address with the secretary-treasurer of the Board, and after publishing such notice in one newspaper published in the English language and one newspaper published in the Spanish language at Manila at least once per week for a like period. The Board of Dental Examiners shall issue a dental surgeon's certificate to each candidate who furnishes satisfactory proof of having received a diploma as either doctor of dental medicine or doctor of dental surgery from a legally incorporated dental educational institution, and who in addition passes a satisfactory examination before the Board in the following subjects: Anatomy, physiology, histology, physics, chemistry, metallurgy, dental anatomy and physiology, dental materia medica, therapeutics, dental pathology and bacteriology, orthodontia, oral surgery, operative dentistry, and prosthetic dentistry. For each such certificate the secretary-treasurer of the Board shall collect a fee of ten dollars.

The Board is further empowered to make such rules and regulations not in conflict with the provisions of this act as may be necessary to carry said provisions into effect.

Sec. 4. The Board shall, on or before the thirtieth day of June of each year, make a report to the Secretary of the Interior of its proceedings during the past year, and of all moneys received and disbursed by it during that period.

Sec. 5. Sixty days after the first meeting of the Board of Dental Examiners for the Philippine Islands and subsequent to the passage of this act, it shall be unlawful for any person to practice dentistry in any of its branches in the Philippine Islands, without a certificate of registration from the Board of Dental Examiners or without having filed with the secretary-treasurer of said Board an affidavit for the purpose of securing a registration certificate, setting forth the time and place in which he has practiced dentistry in the Philippine Islands prior to the passage of this law: *Provided,* That dentists who have passed successful examinations before a board established by the Provost-Marshal-General, city of Manila, pursuant to authority from the Military Governor of the Philippine Islands, dated August second, eighteen hundred and ninety-nine, shall be furnished with a certificate of registration by the Board of Dental Examiners on payment of the required fee for registration without further examination: *Provided also,* That nothing in this act shall apply to dental surgeons of the United States Army on duty in the Philippine Islands, nor in any way apply to or affect any person who was resident in the Philippine Islands and lawfully engaged in the practice of dentistry there prior to the passage of this act: *And provided further,* That persons who have studied medicine in the Santo Tomas University at Manila for a period of not less than two years and who have received the title of "Cirujanos Ministrantes" and who have studied dentistry for the last four months of their course in such university, may be registered as undergraduates in dentistry upon passing a satisfactory examination before the Board, and, when so registered, shall be authorized to practice dentistry in remote towns where no regularly qualified dentist is available. The names of the towns in which each such undergraduate in dentistry is authorized to practice shall be included in his certificate of registration. The secretary-treasurer shall collect a fee of five dollars for each certificate of registration as undergraduate in dentistry issued by the Board.

Sec. 6. Every person engaged in the practice of dentistry in the Philippine Islands at the time of the passage of this act shall within sixty days from the date of its passage register with the secretary-treasurer of the Board and pay the usual fee of registration, and the secretary-treasurer shall issue the usual certificate of registration to each person so registered. Any person failing to comply with this provision within the stated period shall be required to appear before the Board and pass a satisfactory examination before it shall be lawful for him to again engage in the practice of dentistry in the Philippine Islands.

SEC. 7. Any person shall be regarded as practicing dentistry within the meaning of this act who shall for a fee, salary, or other reward, paid to himself or to another person, perform any operation or part of an operation upon the human teeth or jaws, or who shall restore lost teeth, jaws, or portions of jaws artificially, or who shall treat diseases or lesions or correct malpositions thereof; but this provision shall not apply to artisans engaged in the mechanical construction of artificial dentures or other oral devices, or to students of dentistry practicing in any legally chartered dental school or college on patients under the direct supervision of an instructor in such dental school or college: *And provided further*, That this provision shall not be construed to interfere with physicians or surgeons in their legitimate practice as defined by act numbered Three hundred and ten.

SEC. 8. Any two members of the Board may issue a temporary certificate of registration to an applicant upon the presentation by such applicant of satisfactory evidence that he possesses the necessary qualifications to practice dentistry, such certificate to remain in force only until the next regular meeting of the Board, at which time the person to whom it has been issued shall report for examination. Temporary licenses shall be granted only when the Board is not in session and will not meet within thirty days. In no case shall a temporary certificate of registration be renewed or extended, nor shall a second temporary certificate be granted to any person. The fee for a temporary certificate of registration shall be five dollars, and the applicant shall further deposit with the secretary-treasurer of the Board the sum of five dollars to complete the payment of his fee for a regular certificate. He shall also file with the secretary-treasurer of the Board an affidavit to the effect that it is his intention to appear at the next regular meeting of the Board and to submit to an examination with a view to obtaining a permanent certificate. Should he appear and pass a satisfactory examination, a permanent certificate shall be granted to him without additional charge. Should he fail to appear and pass such examination, the money deposited by him shall not be returned to him, but shall be paid to the Treasurer of the Philippine Archipelago.

SEC. 9. The Board of Dental Examiners shall refuse to issue either of the certificates provided for by this act to any person convicted by a court of competent jurisdiction of any criminal offense, or to any person guilty of immoral or dishonorable conduct or of unsound mind, and in the event of such refusal shall give to the applicant a written statement setting forth the reason for its action, which statement shall be incorporated in the record of the Board. The Board may revoke a certificate for like cause, or for unprofessional conduct after due notice to the person interested and on hearing, subject to an appeal to the Board of Health for the Philippine Islands, the decision of which shall be final.

SEC. 10. Every practitioner of dentistry shall display in a conspicuous place upon the house or office where he practices his full name, and he shall further display his certificate of registration in his office in plain sight of patients occupying his dental chair. Any person violating this provision shall, upon conviction, be punished by a fine of not less than twenty-five nor more than one hundred dollars for each offense. Any owner, proprietor or manager of a dental office or establishment who shall fail to cause to be displayed as provided in this section the registration certificate of each person practicing dentistry in such office or establishment shall, upon conviction, be punished by a like fine.

SEC. 11. No person shall in any way advertise as bachelor of dental surgery, doctor of dental surgery, master of dental surgery, licentiate of dental surgery, doctor of dental medicine, or dental surgeon, or append the letters B.D.S., D.D.S., M.D.S., L.D.S., or D.M.D. to his name, who has not had duly conferred upon him by diploma from some school, college, university, or board of examiners legally qualified to confer the same, the right to assume said title, nor shall any person assume any title or prefix or append any letters to his name to represent falsely that he has received a dental degree or certificate of registration. Any person violating this provision shall, upon conviction, be subject to a fine of not more than one hundred dollars or to imprisonment for not more than ninety days.

SEC. 12. Where the word "dollars" is used in this act, it shall be understood to mean dollars in money of the United States.

SEC. 13. This act shall take effect on its passage.

Enacted January 10, 1903.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

May, June and July, 1906.

MAY.

Alabama Dental Association. Mobile. Four days: May 8th to 11th.

Arkansas State Dental Association. Fort Smith. Two days: May 9th and 10th.

Florida State Dental Association. Atlantic Beach. Three days: May 16th to 18th.

Illinois State Dental Society. Springfield. Three days: May 8th to 10th.

Iowa State Dental Society. Des Moines. Three days: May 1st to 3d.

Kansas Dental Association. Topeka. Three days: May 10th to 12th.

Lake Erie Dental Association. Cambridge Springs, Pa. Three days: May 15th to 17th.

Nebraska State Dental Society. Omaha. Three days: May 15th to 17th.

New Hampshire Dental Society. Plymouth. Two days: May 8th and 9th.

New York State Dental Society. Albany. Two days: May 11th and 12th.

Oklahoma Dental Association. Oklahoma City. Three days: May 14th to 16th.

Southern Dental Society of New Jersey. Camden. Two days: May 16th and 17th.

Southern Wisconsin Dental Association. Milwaukee. Two days: May 30th and 31st.

Tennessee State Dental Association. Nashville. Three days: May 15th to 17th.

Vermont State Dental Society. Brattleboro. Three days: May 16th to 18th.

JUNE.

American Medical Association—Section on Stomatology. Boston, Mass. Four days: June 5th to 8th.

Georgia State Dental Society. Savannah. Three days: June 19th to 21st.

Indiana State Dental Association. West Baden and French Lick Springs. Three days: June 26th to 28th.

Kentucky State Dental Association. Louisville. Three days: June 12th to 14th.

Louisiana State Dental Society. New Orleans. Two days: June 1st and 2d.

Massachusetts Dental Society. Boston. Four days: June 5th to 8th.

Minnesota State Dental Association. Minneapolis. Three days: June 11th to 13th.

Mississippi Dental Association. Gulfport. Three days: June 6th to 8th.

Missouri State Dental Association. Springfield. Three days: June 5th to 7th.

Pennsylvania State Dental Society. Philadelphia. Three days: June 26th to 28th.

South Carolina State Dental Association. Charleston. Four days: June 26th to 29th.

South Dakota State Dental Society. Vermilion. Three days: June 12th to 14th.

Texas State Dental Association. Galveston. Three days: June 14th to 16th.

JULY.

Maine Dental Society. Moosehead Lake. Three days: July 17th to 19th.

New Jersey State Dental Society. Asbury Park. Three days: July 18th to 20th.

Examiners' Meetings.

Arizona Board of Examiners. Tucson. July 2d to 4th.

Arkansas Board of Dental Examiners. Fort Smith. May 7th and 8th.

Connecticut Dental Commissioners. Hartford. June 27th to 29th.

Florida Board of Dental Examiners. Atlantic Beach. May 14th.

Idaho Board of Dental Examiners. Boise City. June 13th to 15th.

Illinois Board of Dental Examiners. Chicago. June 4th.

Indiana Board of Dental Examiners. Indianapolis. June 12th.

Iowa Board of Examiners. Iowa City. June 14th.

KANSAS BOARD OF EXAMINERS. Topeka. May 7th to 9th.

KENTUCKY BOARD OF DENTAL EXAMINERS. Louisville. June 5th.

MARYLAND BOARD OF DENTAL EXAMINERS. Baltimore. May 14th and 15th.

MINNESOTA BOARD OF EXAMINERS. Minneapolis. June 14th to 16th.

MISSOURI BOARD OF DENTAL EXAMINERS. Kansas City, May 14th; St. Louis, May 28th.

NEBRASKA STATE BOARD OF EXAMINERS. Lincoln. May 29th to 31st.

NEW HAMPSHIRE BOARD OF REGISTRATION. Manchester. June 13th to 15th.

NEW JERSEY BOARD OF DENTAL EXAMINERS. Trenton. July 9th to 13th.

NORTH CAROLINA BOARD OF EXAMINERS. High Point. June 18th to 20th.

OHIO BOARD OF DENTAL EXAMINERS. Columbus. June 26th to 28th.

OKLAHOMA BOARD OF EXAMINERS. Oklahoma City. May 15th to 17th.

PENNSYLVANIA BOARD OF EXAMINERS. Philadelphia and Pittsburg, June 5th to 8th.

RHODE ISLAND BOARD OF REGISTRATION. Providence. July 10th to 12th.

SOUTH CAROLINA BOARD OF EXAMINERS. Isle of Palms. June 22d.

TENNESSEE BOARD OF DENTAL EXAMINERS. Nashville. May 15th to 17th.

VERMONT BOARD OF DENTAL EXAMINERS. Montpelier. July 10th to 12th.

CENTRAL-VEREIN DEUTSCHER ZAHNÄRZTE.

THE next annual meeting of the Central-Verein Deutscher Zahnärzte will be held at Dresden (Saxony) August 4 to 6, 1906, immediately following the meeting of the American Dental Society of Europe in Berlin, and preceding that of the Fédération Dentaire Internationale, which takes place at Geneva on the 8th and 9th of August. Members of the profession in America who took part in the meeting of the C. V. D. Z. at Hanover know that they will be sure of a hearty welcome, and I hereby cordially invite as many of them as intend visiting Europe during the coming summer to arrange their plans so as to meet with us in Dresden at the above-mentioned date.

W. D. MILLER, *President.*

NATIONAL DENTAL ASSOCIATION.

COMMITTEE ON DENTAL HISTORY.

At the Buffalo meeting of the National Dental Association, the Committee on History of Dentistry reported to the association that Dr. Vincenzo Guerini of Naples, Italy, had written a History of Dentistry from the earliest times down to the beginning of the nineteenth century, which work is in the hands of the committee, having been translated into English and fully revised and edited. Dr. Guerini has generously placed the publication of this great work under the patronage of the National Dental Association in token of his appreciation of American dental development. In order that the work may be published without financial loss it is necessary that about 700 subscriptions for copies at $5.00 each be obtained before contracts for printing, binding, and publishing the work can be entered into, and the duty of securing these advance subscriptions has been assigned to the Committee on History of Dentistry of the National Dental Association.

The committee believes that the general and growing interest in the history of our profession is a sufficient warrant for this undertaking. Our historical records are scattered through a vast literature and much of it is of great antiquity. These data have never before been gathered together and arranged in a consequential logical order. Dr. Guerini has spent many years of his professional life and large amounts of money in collecting the material for this work. It has involved the searching of libraries and museums, the translation of many old documents and publications, and the digesting and arranging of this matter into proper form. As an historical writer the distinguished author needs no introduction, as his contributions on dental history in our magazines are well known, and their excellence is an earnest of the excellent and exhaustive character of his larger work now in the hands of the Committee on History of Dentistry for publication.

The importance and value of dental art and science as a humane service is well recognized, but we are so accustomed to view this question from the modern standpoint that we, generally speaking, overlook the immense work done by our predecessors, reaching far back in unbroken line to the mists of antiquity. It was they who laid the foundations upon which modern dentistry has been built, and no man can peruse the record of their efforts as set forth in Dr. Guerini's book without developing a higher appreciation of their work and a keener realization of the worth and dignity of the calling which they in common with ourselves followed.

It is the desire of the committee having this matter in charge to secure as promptly as possible the subscriptions necessary before the work can be published. We ask you to consider this as a personal appeal to forward your subscription for the work to Dr. Charles S. Butler, The Frontenac, Buffalo, N. Y., who, with the treasurer of the National Dental Association, Dr. V. E. Turner, Raleigh, N. C., will act as custodian of the publication fund.

Announcement will be from time to time made in the dental journals of the growth of the subscription list and the progress of the work of publication. The sooner the required 700 names are obtained, the sooner the work can be issued. The volume, it is estimated, will comprise about 500 pages. It will be profusely illustrated, and bound in cloth.

In case this proposed publication meets with the success which it merits, a second and companion volume, treating of the more modern aspect of dentistry, will probably be issued under the same auspices and conditions.

Edward C. Kirk, Philadelphia.
Wm. H. Trueman, Philadelphia.
Gordon White, Nashville, Tenn.
H. L. Ambler, Cleveland, Ohio.
Jas. McManus, Hartford, Conn.
J. Y. Crawford, Nashville, Tenn.
A. H. Fuller, St. Louis, Mo.
S. A. Freeman, Buffalo, N. Y.
W. E. Boardman, Boston, Mass.
Charles S. Butler, Buffalo, N. Y.

Burton Lee Thorpe, *Sec'y*, St. Louis, Mo.
Chas. McManus, *Chairman*, Hartford, Conn.

AMERICAN SOCIETY OF ORTHODONTISTS.

The next meeting of the American Society of Orthodontists will be held in New York city during Christmas week, 1906.

Frederick S. McKay, *Sec'y*,
St. Louis, Mo.

AMERICAN DENTAL SOCIETY OF EUROPE.

The next meeting of the American Dental Society of Europe will be held at Berlin, Germany, August 1, 2, 3, and 4, 1906. A most cordial invitation is extended to members of the profession to be present.

An interesting program is already assured, and it is hoped to make this one of the most interesting and largely attended meetings in the history of the society.

Geo. O. Webster, *Hon. Sec'y*,
Pariser Platz I, Berlin, Germany.

AMERICAN MEDICAL ASSOCIATION—SECTION ON STOMATOLOGY

AND THE

MASSACHUSETTS STATE DENTAL SOCIETY

The next meeting of the American Medical Association will be held in Boston, Mass., June 5 to 8, 1906.

Those wishing to join the American Medical Association, Section on Stomatology, may do so by writing to the secretary for blank to be filled out and signed by the present president and secretary of their state or local dental society. Inclose this with five dollars ($5.00), and send to the secretary of the Section on Stomatology.

The Massachusetts State Dental Society will hold a joint meeting with the Section on Stomatology.

H. O. Carlton, *Chairman.*
Eugene S. Talbot, *Sec'y*,
Chicago, Ill.

Program—Section on Stomatology.

1. Chairman's Address. H. P. Carlton, San Francisco.

2. "The Structure of the Jaws of the Lower Vertebrates." J. S. Kingsley, Boston, Mass.

3. "Development of the Human Jaw." Chas. L. Minot, Chicago.

4. "Palates of the Feeble-minded." Walter Channing, Brookline, Mass.

5. "The Reflexes of Dentition from the Physician's Standpoint." Chas. Hunter Dunn, Boston, Mass. Discussion opened by Thos. Morgan Rotch, Boston, and A. C. Cotton, Chicago.

6. "Gingival Manifestations of Metabolic Disorders." Alfred C. Croftan, Chicago.

7. "Interstitial Gingivitis Produced by Auto-intoxication as Indicated by the Urine and Blood Pressure." E. S. Talbot, Chicago.

8. "Treatment of Loosened Teeth." M. L. Rhein, New York city.

9. "Conservatism in the Treatment of Infants with Hare-lip and Cleft Palate." G. V. I. Brown, Milwaukee, Wis.

10. "Conservative Surgery of the Lip." Thos. Fillebrown, Boston.

11. "The Prevention of Disfiguring Scars About the Face." M. I. Schamberg, Philadelphia.

12. "Some Pathologic Features of the Pulp." V. A. Latham, Chicago.

13. "The Relation of Systemic Diseases to the Conditions of the Oral Cavity." James E. Power, Providence.

14. "Medical Phases of Dental Disorders." Samuel A. Hopkins, Boston.

15. "The Botanical Diagnosis of Leptothrix Racemosa and Its Relations to the Modern Doctrine of Bacteriology." Filandro Vicentini, Chieti, Italy.

16. "Practical Innervation of the Trifacial Nerve." M. H. Fletcher, Cincinnati, Ohio.

17. "Practical Ethics." George F. Eames, Boston.

18. "Two Cases of Infantile Scurvy." Alice M. Steeves, Boston.

PROGRAM—MASSACHUSETTS SOCIETY.

"Clinical Pathologic Studies of Asymmetrical, Facial, Maxillary and Dental Development," G. V. I. Brown, Milwaukee, Wis.

"Some of the Factors that Modify Jaws and Other Parts of the Face," M. H. Cryer, Philadelphia, Pa.

(Subject to be announced), Vida A. Latham, Chicago, Ill.

"This the Land of Unlimited Opportunity for All, and the Duty of the Dentist in These Days of Doubt," James C. Monaghan, Washington, D. C.

"The Necessity for an Endowment of Dental Schools," Wm. H. Potter, Boston, Mass.

"Cysts of the Jaws," Murdoch C. Smith, Lynn, Mass.

"Dental Education," Eugene S. Talbot, Chicago, Ill.

"The Need of an Independent Journal in the Dental Profession," Herbert L. Wheeler, New York, N. Y.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE annual meeting of the National Association of Dental Faculties will be held in Atlanta, Ga., commencing at 2 P.M., Friday, September 14, 1906. The executive committee will meet at 10 A.M. on the same day.

H. B. TILESTON, *Ch'man Ex. Committee,*
R. M. SANGER, *Sec'y Ex. Committee,*
East Orange, N. J.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE twenty-fourth annual meeting of the National Association of Dental Examiners will be held at the New Kimball House, Atlanta, Ga., September 14th to 17th, commencing 10 A.M., Friday, September 14, 1906.

The rates per day will be, European plan, from $1.50 to $4.00, American plan, from $3.00 to $6.00, governed by choice of rooms.

The convention hall is in the hotel, and every effort will be made by the proprietors for the care and comfort of the members.

Arrangements are being perfected for those desiring a short ocean trip at reduced rates, via the Clyde and Old Dominion steamship lines, notice of which will be given by circular later.

CHAS. A. MEEKER, *Sec'y,*
29 Fulton st., Newark, N. J.

ALABAMA DENTAL ASSOCIATION.

THE next annual meeting of the Alabama Dental Association will be held in the Commercial Club rooms, Mobile, Ala., May 8 to 11, 1906. A most interesting program is being prepared, and all the leading manufacturers will have exhibits.

A full attendance on the part of the members is urged, and a cordial invitation is extended to all ethical non-association dentists in the state, and to our professional brethren from other states. The usual reduced railroad rates on the certificate plan will be secured.

L. A. CRUMLEY, *Sec'y,*
401 Jefferson Co. Bank bldg.,
Birmingham, Ala.

NEW YORK STATE DENTAL SOCIETY.

The thirty-eighth annual meeting of the New York State Dental Society will be held in Albany, May 11 and 12, 1906, when the following program will be presented:

President's Address, Dr. W. J. Turner; Report of the Correspondent, Dr. Ellison Hillyer; Report of Committee on Practice, Dr. E. Howard Babcock; Report of Committee on Scientific Research, Dr. F. W. Low. Essayists: Dr. Edward C. Kirk, Philadelphia; Dr. J. Q. Byram, Indianapolis, Ind.; Dr. H. A. Pullen, Dr. G. B. Mitchell, and Dr. W. B. Dills, Brooklyn, N. Y.

CLINICS.

1. J. Q. Byram, Indianapolis, Ind. "Fusing Porcelain, Cavity Preparation, etc."
2. W. A. Burns, St. Thomas, Ont. "Quick Repair of Porcelain Facings in the Mouth."
3. G. A. Billow, Dayton, Ohio. "Root-canal Filling."
4. A. P. Burkhart, Buffalo, N. Y. "Steele's Detachable Facings."
5. P. S. Bollinger, Dayton, Ohio. "The Things We Know—Let Us Do Them Better."
6. C. J. Barber, Auburn, N. Y. "Replacing Facings on Richmond Crowns and Bridges in the Mouth."
7. Wm. Crenshaw, Atlanta, Ga. (a) "Improved Molar and Bicuspid Matrices; (b) Application and Use of the Bow Brace and Anterior Teeth Matrices."
8. I. J. Coe, Baldwinsville, N. Y. "The Use of Cement Under Gold and Amalgam Fillings."
9. C. B. Cragin, Kingston, N. Y. "Recutting Burs."
10. G. A. Englert, Catskill, N. Y. "Anesthetization of the Dental Pulp in the Presence of Pulp-Nodules and Other Obstinate Conditions."
11. M. F. Finley, Washington, D. C. "Orthodontia" (Jackson system).
12. W. B. Fahnestock, Cincinnati, Ohio. "A Simple Method of Making Gum-Sections with Prosthetic Porcelain for Partial Dentures and Removable Bridges."
13. N. E. Foote, Whitehall, N. Y. "An Easy Method of Making a Seamless Gold Crown."
14. G. E. Freeborn, Buffalo, N. Y. "Olivian Plate Swager."
15. F. L. Fossume, New York, N. Y. "Instrumentation in Pyorrhea, Using Practical Instruments."
16. J. W. Graves, Rochester, N. Y. "Bicuspid Shell Crown."
17. E. R. Griswold, Dansville, N. Y. "Whiteside Crown in Bridge Work."
18. E. D. Garden, Tarrytown, N. Y. "Mineral or All-Porcelain Plate."
19. H. W. Gillett, New York, N. Y. "Variations in Gold Inlay Technique."
20. B. S. Hert, Rochester, N. Y. "Gold Inlay."
21. H. L. Howe, Boston, Mass. "Orthodontia."
22. V. H. Jackson, New York, N. Y. "Orthodontia" (Jackson system).
23. C. C. Lumley, St. Thomas, Ont. "Practical Things."
24. S. C. Luckett, Joplin, Mo. "Gold Inlays for Masticating Surfaces, Using Special Standard Gold for Matrices and Standard Gold Solder for Contour."
25. E. B. Lodge, Cleveland, O. "The Technique of Taking X-ray Skiagraphs of the Maxillæ, Teeth, and Antra."
26. F. B. Lawrence, El Dorado, Kan. "Gold Inlay Filling."
27. W. J. Mummery, Ann Arbor, Mich. "The Inlay Post and the Inlay Crown."
28. H. S. Miller, Rochester, N. Y. "A Few Stunts on Amalgam."
29. J. Mann, Middleburgh, N. Y. "A Simple but Practical Method of Repairing a Broken Facing on Any of the Six Anterior Teeth Without Removing Bridge."
30. A. J. McDonagh, Toronto, Ont. "Hollow Porcelain Inlays."
31. C. H. Moll, Rochester, N. Y. "Wiping-in Gold Fillings" (P. H. Smith method).
32. H. A. Pullen, Buffalo, N. Y. "Orthodontia Technique."
33. E. B. Prentiss, New York, N. Y. "An Ideal Molar Abutment for Small Bridge Work."
34. S. Palmer, Poughkeepsie, N. Y. "Porcelain Art."
35. J. F. Ross, Toronto, Ont. "Porcelain Inlay, Labial Surface of Incisor, Restoring Receded Gum with Gum-Enamel."
36. W. S. Rose, Schenectady, N. Y. "Reinforced Porcelain-faced Shell Crown, Two-Piece or Seamless."
37. J. G. Roberts, Brampton, Ont. "Immediate Devitalization and Removal of Pulp, Without the Use of Cocain."

38. F. M. Rood, Rochester, N. Y. "Method of Tipping Porcelain Facings in Crown and Bridge Work."

39. A. C. Rich, Saratoga Springs, N. Y. "Removable Bridge Plate."

40. J. B. Sapp, Cleveland, Ohio. "Dental Obtunding."

41. N. T. Shields, New York, N. Y. "The Use of Keeton-Williams Gold in Combination with Cement."

42. P. H. Smith, Rochester, N. Y. "Making and Serrating Instruments for Wiping in Gold Fillings."

43. D. H. Squires, Buffalo, N. Y. "Gold-Platinum Fillings."

44. T. C. Trigger, St. Thomas, Ont. "New and Original Set of Inlay Matrix Instruments, Giving a Clinical Application of their Use and also the Introduction of Other Accessory Appliances."

45. W. C. Trotter, Toronto, Ont. "An Easy and Inexpensive Way of Making Gold Plates."

46. H. H. Tompkins, Utica, N. Y. "Practical Novelties in Porcelain."

47. W. H. Upjohn, Lafayette, Ind. "Possibilities of Porcelain in Operative Dentistry."

48. M. VanLoan, Albany, N. Y. "The Retraction of the Right Half of the Lower Jaw After it Had Been Displaced by the Removal of the Left Half."

49. S. M. Weaver, Cleveland, O. "The Fusing of Porcelain Using a Pyrometer Attachment."

50. C. M. Work, Ottumwa, Iowa. "Porcelain Inlay."

51. F. R. Watson, Georgetown, Ont. "Filling Lower Cervical Cavities with Gold, without Rubber Dam."

52. D. H. Young, Attica, N. Y. "The Carbon Method of Constructing a Porcelain-faced Crown."

53. S. Gowan, Brockville, Ont. "Extensive Restoration of Broken-down Molars."

54. W. H. Fordham, Scranton, Pa. (Subject to be announced).

The sessions will be held in the Assembly Hall of Hotel Ten Eyck, and a very cordial invitation is extended to all reputable members of the profession to attend the meeting. Trunk-line association rates on all railways.

Charles S. Butler, *Sec'y*,
The Frontenac, Buffalo, N. Y.

IOWA STATE DENTAL SOCIETY.

The forty-fourth annual meeting of the Iowa State Dental Society will be held at Des Moines, Iowa, May 1, 2, and 3, 1906.

C. W. Bruner, *Sec'y*, Waterloo, Iowa.

OKLAHOMA DENTAL ASSOCIATION.

The sixteenth annual meeting of the Oklahoma Dental Association will be held in Oklahoma City, Okla., May 14, 15, and 16, 1906. The profession is cordially invited to attend. Dental manufacturers' exhibits are desired. For particulars address

C. L. White, *Sec'y*,
208 Bassett bldg., Oklahoma City, Okla.

DENTAL DEPARTMENT OF WASHINGTON UNIVERSITY.

Alumni Association.

The Alumni Association of the Dental Department of Washington University (Missouri Dental College) will hold their annual clinic in the college building, Twenty-seventh and Locust streets, St. Louis, Mo., on Tuesday, May 22, 1906.

Address all communications to Dr. F. B. Lynott, Frisco bldg., St. Louis, Mo.

B. N. Pippin, *President*,
F. B. Lynott, *Sec'y*.

BALTIMORE COLLEGE OF DENTAL SURGERY.

Alumni Association.

The Alumni Association of the Baltimore College of Dental Surgery will hold its reunion at the college building, Baltimore, Md., May 10 and 11, 1906.

The Committee has endeavored to reach by letter every graduate it has been able to locate. Those who have not received preliminary notice of this reunion are requested to send their addresses to the secretary, so that they may receive an official program.

An interesting program is being arranged, consisting of clinics and papers by men of exceptional ability, also reunion of classes and

alumni dinner. All ethical members of the profession are cordially invited to attend.

Special railroad fare (by certificate plan) on all trunk lines, and reduced hotel rates may be obtained.

W. W. Dunbracco, *Sec'y*,
327 N. Charles st., Baltimore, Md.

NEW YORK COLLEGE OF DENTISTRY.

Anniversary—Class of '96.

The class of 1896 of the New York College of Dentistry will celebrate its tenth anniversary in May 1906.

Gustave R. Stein, *Chairman*,
New York City.

UNIVERSITY OF MARYLAND DENTAL DEPARTMENT.

Alumni Association.

The annual meeting and election of officers of the Alumni Association of the University of Maryland, Dental Department, will take place in the new dental building, corner of Lombard and Greene streets, Baltimore, Md., May 8 and 9, 1906. A number of clinics will be given by prominent practitioners, and an invitation is extended to all ethical alumni to attend and give a clinic, notice of which should be sent to the secretary. Exhibits by many manufacturers.

L. W. Farinholt, *Sec'y*,
330 N. Charles st., Baltimore, Md.

PHILADELPHIA DENTAL COLLEGE.

Alumni Society.

A grand social reunion of the graduates of the Philadelphia Dental College is planned for 1906. Alumni Day falls upon Thursday, May 31st, and will be celebrated in a highly interesting manner by clinics and a business meeting in the college at Eighteenth and Buttonwood sts., and a banquet or reception in the evening. Dr. Wheeler of New York will read the annual paper. Twenty-five hundred copies of the alumni journal will be mailed to the graduates of the Philadelphia Dental College.

A. Irwin, *Sec'y*.

INTERSTATE DENTAL FRATERNITY.

The annual meeting of the Interstate Dental Fraternity will be held at the New Kimball House, Atlanta, Ga., on Monday, September 7, 1906.

The meeting and banquet will be in charge of Dr. Frank Holland, the vice-president for Georgia. Dr. Holland's well-established reputation as a host is a sufficient guarantee for a royal good time for all the fraternity who can arrange to be there. Do not miss it.

R. M. Sanger, *Nat'l Sec'y*.

ST. LOUIS DENTAL COLLEGE.

Alumni Association—Annual Clinic.

The annual clinic and class reunion of the Alumni Association of the St. Louis Dental College will be held in St. Louis, May 7 and 8, 1906. The various committees have been working energetically, each in its different line, and report that this will be the largest clinic given by the association. The committee on essays have a number of valuable and original papers. The committee on clinics have already secured eighty-five interesting clinics, and expect to have one hundred on the day of the clinic.

R. O. Butts, *Sec'y*,
St. Louis, Mo.

NEW HAMPSHIRE DENTAL SOCIETY.

The twenty-ninth annual session of the New Hampshire Dental Society will be held at the Pemigewassett House, Plymouth, N. H. (Gateway to the White Mountains), May 8 and 9, 1906.

F. F. Fisher, *Sec'y*,
Elm st., Manchester, N. H.

SOUTHERN DENTAL SOCIETY OF NEW JERSEY.

The Southern Dental Society of the State of New Jersey will hold all-day clinics in Camden, May 16 and 17, 1906, and listen to illustrated lectures Wednesday evening, May 16th.

An interesting program, comprising either table or chair demonstrations by about twenty clinicians from different cities, on the most practical topics of the day, will be presented. A number of exhibits, comprising the latest and best inventions and supplies, will be ready for inspection.

The entire fifth floor of the Temple Building, 413-423 Market st., has been provided for the accommodation of visitors, friends, guests, clinicians, exhibitors, and dentists. You are cordially invited to attend.

A. Irwin,
Chairman Ex. Com.

KANSAS STATE DENTAL ASSOCIATION.

The next annual session of the Kansas State Dental Association will be held in Topeka, May 10, 11, and 12, 1906. Dr. J. E. Nyman of Chicago, Ill., and Dr. Geo. Edwin Hunt of Indianapolis, Ind., will be present as our guests.

All ethical dentists are cordially invited to attend.

F. O. Hetrick, *Sec'y*,
Ottawa, Kans.

NEBRASKA STATE DENTAL SOCIETY.

The thirtieth annual meeting of the Nebraska State Dental Society will be held in Omaha, May 15, 16, and 17, 1906, at the Creighton Dental College. Dr. L. P. Haskell and Dr. J. N. MacDowell, both of Chicago, will be with us, and the indications are that we will have the best meeting in the history of the society. A cordial invitation is extended to all reputable practitioners to attend.

M. E. Vance, *Cor. Sec'y.*
Lincoln, Neb.

LAKE ERIE DENTAL ASSOCIATION.

The annual meeting of the Lake Erie Dental Association will be held at the Hotel Rider, Cambridge Springs, Pa., May 15, 16, and 17, 1906.

Round trip excursion rates on all roads may be procured.

The committees are working hard to make this an extra-fine meeting. All ethical dentists are cordially invited to attend.

V. H. McAlpin, *Sec'y*, Warren, Pa.

TENNESSEE STATE DENTAL ASSOCIATION.

The next meeting of the Tennessee State Dental Association will be held in Nashville, Tenn., May 15, 16, and 17, 1906.

Chas. A. Tavel, *Sec'y*,
Memphis, Tenn.

FLORIDA STATE DENTAL SOCIETY.

Change of Date.

The twenty-third annual meeting of the Florida State Dental Society will be held at the Continental Hotel, Atlantic Beach (near Jacksonville), Wednesday, May 16, 1906, continuing in session three days.

All ethical practitioners are most cordially invited to be present. An interesting program has been arranged. A number of special clinics will be provided.

Carroll H. Frink, *Cor. Sec'y*,
Fernandina, Fla.

VERMONT STATE DENTAL SOCIETY.

The thirtieth annual meeting of the Vermont State Dental Society will be held at Brattleboro, Vt., May 16, 17, and 18, 1906.

It is expected that we will have the largest attendance of any meeting ever held by this society. All the leading manufacturers have signified their intention of making an exhibit of their products, and this adds greatly to the success of a convention.

Every progressive dentist should be present. Special social features for Thursday evening.

Thomas Mound, *Sec'y*,
Rutland, Vt.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

The twentieth annual meeting of the Southern Wisconsin Dental Association will be held at Milwaukee, Wis., May 30 and 31, 1906.

Special stress will be laid on the clinical part of the meeting, as we are going to try and make it one of the largest the state has ever held. Some of the best clinicians are coming from our border states, and we are looking for a rousing good meeting. All ethical practitioners are cordially invited to meet with us.

C. W. Collver, *Sec'y*,
Clinton, Wis.

ARKANSAS STATE DENTAL ASSOCIATION.

The Arkansas State Dental Association meets May 9 and 10, 1906, at Fort Smith, Ark. The State Board of Examiners meets May 7 and 8, 1906.

Henry P. Hopkins, *Sec'y*.

LOUISIANA STATE DENTAL SOCIETY.

The annual meeting of the Louisiana State Dental Society will be held at New Orleans, La., June 1 and 2, 1906.

A. L. Plough, *Cor. Sec'y*,
New Orleans, La.

GEORGIA STATE DENTAL SOCIETY.

The thirty-eighth annual meeting of the Georgia State Dental Society will be held June 19 to 21, 1906, at Savannah, Ga. This change in time of meeting is to avoid conflict with the Florida Association and for the convenience of manufacturers; also for other reasons it has been considered advisable. The original dates set for this meeting were June 12th to 14th inclusive.

An excellent program of papers and clinics is being prepared, and a most pleasant and profitable meeting is anticipated. A cordial invitation is extended to all ethical members of the profession.

S. H. McKee, *President*.

MISSISSIPPI DENTAL ASSOCIATION.

The thirteenth annual meeting of the Mississippi Dental Association will be held in Gulfport, June 6, 7, and 8, 1906.

All ethical practitioners of this and other states are cordially invited to attend. Every effort is being made to have this the largest and most profitable meeting ever held, and the pleasures of Gulfport, on the coast, at this time of year, alone form a special feature.

Reduced hotel accommodations and the usual reduced rates on all railroads will be obtained.

For complete details address

E. Douglas Hood, *Sec'y*,
Tupelo, Miss.

MINNESOTA STATE DENTAL ASSOCIATION.

The twenty-third annual meeting of the Minnesota State Dental Association will be held in Minneapolis, Minn., at the Dental Department of the State University, on June 11, 12, and 13, 1906.

J. F. McCrea, *President*.
F. E. Cobb, *Sec'y*,
Minneapolis, Minn.

SOUTH CAROLINA STATE DENTAL ASSOCIATION.

The annual meeting of the South Carolina State Dental Association will be held in the city of Charleston, on the Isle of Palms, S. C., June 26 to 29, 1906. We expect a very profitable and enjoyable meeting, and a cordial invitation is extended to all ethical dentists.

Euston N. Kibler, *Cor. Sec'y*,
Prosperity, S. C.

TEXAS STATE DENTAL ASSOCIATION.

The twenty-sixth annual meeting of the Texas State Dental Association will be held in the city of Galveston, Texas, June 14, 15, and 16, 1906.

The indications are that this meeting will be the best ever held in Texas. All ethical practitioners are extended a cordial invitation to meet with us.

Bush Jones, *Sec'y*, Dallas, Texas.

MISSOURI STATE DENTAL ASSOCIATION.

The forty-first annual meeting of the Missouri State Dental Association will be held at Springfield, Mo., June 5, 6, and 7, 1906.

An unusually interesting program is being arranged. A number of men eminent in the profession have signified their intention of being present and the meeting promises to be the best in the history of the association.

All ethical dentists are cordially invited to be present.

SAM T. BASSETT, *Cor. Sec'y.*
St. Louis, Mo.

NEW JERSEY STATE DENTAL SOCIETY.

CLINICAL CONFERENCE.

AN opportunity is afforded anyone having a difficult case in surgery, orthodontia, operative or prosthetic dentistry, to present the case for consultation at the coming meeting at Asbury Park, N. J., July 18th to 20th. It is hoped that advantage will be taken of this chance to gain the opinion and advice of men of exceptional ability in their special lines.

Correspondence is solicited. The committee desires a concise history of the cases on or before May 30th, if possible.

J. G. HALSEY, *Chairman,*
Swedesboro, N. J.

INDIANA STATE DENTAL ASSOCIATION.

THE forty-eighth annual meeting of the Indiana State Dental Association will be held at the West Baden and French Lick Springs, Indiana, June 26, 27, and 28, 1906.

The social side of this meeting will be a feature, while the papers and clinics have promise of being the best ever given at this society.

Ethical practitioners are invited to resort, recuperate, and re-illume with us.

R. A. ADAMS, *Sec'y,*
Clinton, Ind.

SOUTH DAKOTA STATE DENTAL SOCIETY.

THE next regular meeting of the South Dakota State Dental Society will be held June 12, 13, and 14, 1906, in Vermillion, S. D.

W. F. PRICE, *Sec'y,*
Vermilion, S. D.

MAINE DENTAL SOCIETY.

THE Maine Dental Society will hold its forty-first annual meeting at the Kineo House, Moosehead Lake, Maine, Tuesday, Wednesday, and Thursday, July 17, 18, and 19, 1906.

H. A. KELLEY, *Sec'y,*
Portland, Me.

KENTUCKY STATE DENTAL ASSOCIATION.

CHANGE OF PLACE AND DATE.

THE next annual meeting of the Kentucky State Dental Association will convene at Louisville, Ky., June 12, 13, and 14, 1906, during "Home-coming Week."

Special railroad rates of one fare for round trip can be obtained. All former residents of Kentucky are especially invited. A cordial invitation is extended to the professsion.

W. M. RANDALL, *Sec'y,*
Cor. Brook and B'way,
Louisville, Ky.

NEW ENGLAND ASSOCIATION OF DENTAL EXAMINERS.

AT the annual meeting of the New England Association of Dental Examiners held in Boston, April 5, 1906, the following officers were elected for the ensuing year: K. L. Cleaves, Montpelier, Vt., president; Dwight M. Clapp, Boston, Mass., vice-president; Geo. A. Maxfield, Holyoke, Mass., recorder.

GEO. A. MAXFIELD, *Recorder.*

MIAMI VALLEY DENTAL SOCIETY.

THE dentists of Dayton, Ohio, organized on Monday, April 2, 1906, in the Phillipps House, a society to be known as the Miami Valley Dental Society. We will meet on the first Monday in each month, and dentists from all the surrounding towns will be admitted to membership.

The following officers were elected: P. S. Bollinger, president; E. S. Tissard, vice-president; W. L. Wright, secretary; L. C. Adams, treasurer; M. C. Saul, corresponding secretary. Committee on Arrangements—Drs. Billow, Blanchard, and Zell. Committee on Ethics—Drs. Penfield, Schoff, and Glew. Committee on Membership—Drs. Stewart, Flory, and Hubbard.

M. C. SAUL, *Cor. Sec'y,*
Arcade Bldg., Dayton, Ohio.

WOMAN'S DENTAL ASSOCIATION.

THE annual meeting of the Woman's Dental Association was held at 1716 Chestnut st., Philadelphia, Pa., March 3, 1906, Dr. H. Belle Whitcomb presiding. The following officers were elected for the year 1906-1907: Emily W. Wyeth, president; H. Belle Whitcomb, vice-president; Rebecca R. Cornish, corresponding secretary; Eliza Yerkes, recording secretary; Elizabeth A. Davis McDonald, treasurer. Executive Committee—Frances Crouch, Annie T. Focht, Martha Corkhill, Anna K. Leaming, Matilda Groth.

ELIZA YERKES, *Sec'y,*
Philadelphia, Pa.

MARYLAND BOARD OF DENTAL EXAMINERS.

THE Maryland State Board of Dental Examiners will meet for examination of candidates for certificates, May 14 and 15, 1906, at the dental department of the Baltimore Medical College, Baltimore, at 9 A.M.

For application blanks and all information apply to

F. F. DREW, *Sec'y,*
701 N. Howard st., Baltimore, Md.

KANSAS BOARD OF DENTAL EXAMINERS.

THE Kansas State Board of Dental Examiners will hold a meeting in Topeka, Kans., May 7, 8, and 9, 1906, for the purpose of examining candidates who desire to practice dentistry in this state.

Applicants will be examined in regular college branches, and will also be required to demonstrate their ability in the following practical work: Gold, amalgam and cement filling, vulcanite plate, and kind of crown that is necessary for the clinic assigned. An opportunity will be given each to demonstrate his or her knowledge of working porcelain. Materials and furnace for this will be furnished, but for all other operations the materials, small instruments, and an engine must be furnished by the candidate. All clinics will be furnished by the board. Those intending to take the examination should have their fee of $10 and names in the hands of the secretary by April 15th, in order that ample accommodations for each can be arranged. For further information address

M. I. HULTS, *Sec'y,*
Hutchinson, Kans.

MINNESOTA BOARD OF DENTAL EXAMINERS.

THE Minnesota State Board of Dental Examiners will hold a special meeting on June 14, 15, and 16, 1906, at the dental department of the State University in Minneapolis, Minn., to examine those who desire a license in Minnesota. All applications must be in by noon of June 14th.

GEO. S. TODD, *Sec'y,*
Lake City, Minn.

MISSOURI BOARD OF DENTAL EXAMINERS.

THE Missouri State Board of Dental Examiners will meet for the examination of applicants for registration at Kansas City May 14, and at St. Louis May 28, 1906. For further particulars inquire of

S. C. A. RUBEY, *Sec'y,*
Clinton, Mo.

OKLAHOMA BOARD OF DENTAL EXAMINERS.

THERE will be a meeting of the Oklahoma Board of Dental Examiners held at Oklahoma City, May 15, 16, and 17, 1906, for the purpose of examining candidates. For particulars of examination and blanks address

A. C. HIXON, *Sec'y,*
Guthrie, Okla.

TENNESSEE BOARD OF DENTAL EXAMINERS.

THE Tennessee State Board of Dental Examiners will meet at Nashville, Tenn., May 15 to 17, 1906, for the examination of applicants.

Applicants for examination are required to furnish their own instruments and material for operative and mechanical work.

F. A. SHOTWELL, *Sec'y,*
Rogersville, Tenn.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE annual meeting and examination of the New Hampshire Board of Registration in Dentistry will be held in Manchester, N. H., June 13, 14, and 15, 1906.

A. J. SAWYER, *Sec'y*,
Manchester, N. H.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg, June 5 to 8, 1906.

For papers and particulars address

DR. N. C. SCHAEFFER, *Sec'y Dental Council*,
Harrisburg, Pa.

INDIANA BOARD OF DENTAL EXAMINERS.

THE Indiana State Board of Dental Examiners will hold its next meeting in the Capitol building at Indianapolis, beginning at 9 o'clock, Tuesday, June 12, 1906, and continuing for three days. All applicants for registration in the state will be examined at this time.

Applications must be in the hands of the secretary at least five days prior to above date. For further information apply to

F. R. HENSHAW, *Sec'y*,
Middletown, Indiana.

IOWA BOARD OF DENTAL EXAMINERS.

THE Iowa State Board of Dental Examiners will hold its next meeting at Iowa City, beginning at 9 A.M., Thursday, June 14, 1906.

Practical examination will be held in operative dentistry and written examination in the following branches: anatomy, physiology, chemistry, pathology, therapeutics, materia medica, histology, hygiene, bacteriology, prosthetic dentistry, oral surgery, metallurgy, operative dentistry, orthodontia, and jurisprudence. All applications for examination must be filed with secretary by June 5th.

For application blanks and further information apply to E. D. BROWER, *Sec'y*,
LeMars, Iowa.

IDAHO BOARD OF DENTAL EXAMINERS.

THE Idaho Board of Dental Examiners meets in Boise City, June 13, 14, and 15, 1906, for the purpose of examining applicants for license to practice dentistry in Idaho. Second day devoted to practical operative dentistry, applicants furnishing instruments and material.

C. E. M. LOUX, *Sec'y*,
Pocatello, Idaho.

SOUTH CAROLINA BOARD OF DENTAL EXAMINERS.

THE South Carolina State Board of Dental Examiners will meet in annual session at Isle of Palms, June 22, 1906, for the purpose of examining applicants. Examinations will be both theoretical and practical. Applicants must furnish instruments and material for any demonstrations called for by the board.

B. RUTLEDGE, *Sec'y*,
Florence, S. C.

NORTH CAROLINA BOARD OF DENTAL EXAMINERS.

THE regular annual meeting of the North Carolina State Board of Dental Examiners for the examination of applicants will be held in High Point, N. C., June 18, 19, and 20, 1906.

Written examinations in all the regular college branches will be required, also practical work in both operative and mechanical dentistry. As only graduates of reputable dental colleges will be admitted to examinations, it will be necessary for each applicant to exhibit his diploma before being registered for examination.

For further information address

R. H. JONES, *Sec'y*,
Winston-Salem, N. C.

FLORIDA BOARD OF DENTAL EXAMINERS.

CHANGE OF DATE AND PLACE OF MEETING.

THE regular annual meeting of the Florida State Board of Dental Examiners for the examination of applicants will be held at Atlantic Beach, Fla., May 14, 1906, at 9 o'clock.

Applicants will be examined in the regular college branches, and will also be required to do practical work in filling with gold, amalgam, cement, and crown and bridge work. Applicants must furnish the instruments. Only graduates of reputable dental colleges will be admitted to examinations. It will, therefore, be absolutely necessary for each applicant to exhibit his diploma before examination begins. Absolutely no interchange of licenses with any state.

If applicants wish to take advantage of reduced railroad rates, they should buy tickets to Atlantic Beach.

W. G. Mason, *Sec'y,*
Tampa, Fla.

ARIZONA BOARD OF DENTAL EXAMINERS.

The Arizona Board of Dental Examiners will meet at Tucson, Ariz., July 2, 3, and 4, 1906. Fee twenty-five dollars ($25).

Wm. P. Sims, *Sec'y,*
Bisbee, Ariz.

OHIO BOARD OF DENTAL EXAMINERS.

The regular semi-annual meeting of the Board of Dental Examiners of the State of Ohio, will be held in Columbus, Ohio, June 26, 27, and 28, 1906. Only graduates are eligible to examination. Application, accompanied by the fee of $20, should be filed with the secretary by June 16th. For further information address

H. C. Brown, *Sec'y,*
185 E. State st., Columbus, Ohio.

CONNECTICUT DENTAL COMMISSIONERS.

The Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Wednesday, Thursday, and Friday, June 27, 28, and 29, 1906, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before said meeting.

All applicants should apply to the recorder for proper blanks and rules for conducting the examination. Application blanks must be filled in and sworn to, and with fee, filed with the recorder on or before June 20, 1906.

The annual meeting of the Commission for the election of officers and to transact any business proper to come before said meeting will be held at 2 P.M., July 14, 1906.

By order of Commission.

Gilbert M. Griswold, *Recorder,*
783 Main st., Hartford, Conn.

RHODE ISLAND BOARD OF REGISTRATION.

The Rhode Island State Board of Registration in Dentistry will hold its next meeting for the examination of candidates at the Statehouse, Providence, July 10, 11, and 12, 1906, beginning each day promptly at 9 A.M. Applications, together with the fee of twenty dollars, if first examination, should be in the hands of the secretary not later than July 3d.

W. S. Kenyon, *Sec'y,*
301 Westminster st., Providence, R. I.

KENTUCKY BOARD OF EXAMINERS.

The Kentucky State Board of Dental Examiners will hold their next meeting at Louisville, June 5, 1906. All applicants will be examined in regular college branches, practical work, gold and amalgam fillings. One piece of metal work, materials, small instruments, and an engine must be furnished by the candidate. A fee of $20 will be charged.

For further information, address

J. Richard Wallace, *President,*
"The Masonic," Louisville, Ky.

NEW JERSEY BOARD OF REGISTRATION.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in Trenton, N. J., on July 9, 10, 11, 12, and 13, 1906. Practical and theoretical work must be all completed at that time. Sessions begin promptly at 9 A.M. each day. All applications must be in the hands of the secretary by July 1st.

For further information kindly address

Charles A. Meeker, *Sec'y,*
29 Fulton st., Newark, N. J.

NEBRASKA BOARD OF EXAMINERS.

The next regular meeting of the Nebraska State Board of Dental Examiners will be held in Lincoln, Nebr., May 29, 30, and 31, 1906. This meeting is held for the examination of applicants for a permanent license to practice dentistry in Nebraska. All inquiries should be addressed to C. F. Ladd, *Sec'y*,
1241 "O" st., Lincoln, Nebr.

ILLINOIS BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held in Chicago, at the Northwestern University Dental School, southeast corner of Lake and Dearborn streets, beginning Monday, June 4, 1906, at 9 A.M.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: (1) Any person who has been engaged in the actual, legal, and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (2) is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university; or (3) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee is twenty dollars ($20) with the additional fee of five dollars ($5) for a license.

Address all communications to

J. G. Reid, *Sec'y*,
1204 Trude bldg., Chicago, Ill.

VERMONT BOARD OF DENTAL EXAMINERS.

The next meeting of the Vermont Board of Dental Examiners for the examination of candidates to practice dentistry will be held at Montpelier, July 10, 11, and 12, 1906, commencing at 2 P.M. on the 10th. Headquarters will be at the Pavilion Hotel.

Application, together with the fee of $25, must positively be in the hands of the secretary before July 1st. Candidates for third examination must notify the secretary before July 1st, inclosing the fee of $5. For information, application blanks, and other blanks required, apply to

Geo. F. Cheney, *Sec'y*,
St. Johnsbury, Vermont.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MARCH 1906.

March 6.

No. 814,056, to Closson M. Leffingwell. Dental matrix retainer.

March 13.

No. 814,925, to Frank E. Webster. Gold catcher for fountain spittoon.

No. 815,040, to Percy F. Rutterford. Instrument for stopping teeth.

No. 815,041, to Percy F. Rutterford. Instrument for stopping teeth.

No. 815,153, to Charles P. Fritz. Dental tool.

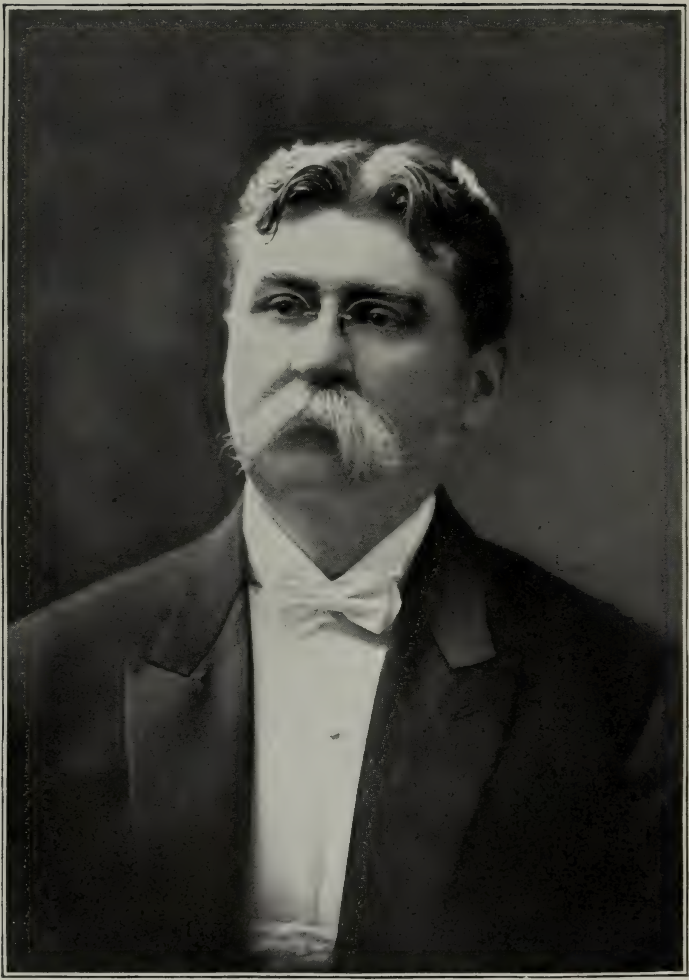
March 20

No. 815,807, to Grant E. Freeborn. Dental plate swager.

No. 815,907, to Cleveland G. Davis. Dental expander or dilator.

March 27.

No. 816,069, to Benoni S. Brown. Dental tool holder or clutch.



DR. J. A. CHAPPLE.

THE

DENTAL COSMOS.

VOL. XLVIII. JUNE 1906. No. 6.

ORIGINAL COMMUNICATIONS.

RECENT WORK WITH THE X RAY AND HIGH-FREQUENCY CURRENTS IN THE DIAGNOSIS OF DENTAL CASES AND IN THE TREATMENT OF PYORRHEA AND CANCER.

By SINCLAIR TOUSEY, A.M., M.D., New York, N. Y.,
SURGEON TO ST. BARTHOLOMEW'S CLINIC.

(Read before the New York Odontological Society at its regular monthly meeting, October 17, 1905.)

AT another time during your present meeting it will be my privilege to give a demonstration of the X-ray apparatus in operation, but a few words of explanation may prove of interest at the present moment. An X-ray tube contains a partial vacuum and the very powerful electric current which passes through it gives rise to a fierce bombardment of molecules, focused by the concave cathode upon the platinum disk in the center of the tube. The cathode stream, going at the rate of twenty thousand miles a second, strikes this disk, which is called the anti-cathode, and gives rise to ethereal vibrations called the X ray. The origin of the X ray may be likened to the production of the tremendous deafening noise which would be produced by the impact of a stream of objects as large as pebbles traveling at the rate of twenty thousand miles a second, and striking some solid obstruction. The X ray has the familiar property of penetrating many substances opaque to ordinary light, and its usefulness for direct examination and by means of X-ray pictures is dependent upon the fact that substances of different densities are unequally transparent to the X ray. In dental radiography metallic fillings are seen as black masses; the enamel of the teeth sometimes shows very perfectly indeed, but not nearly so dark as the metal; the dentin is next in density; then the maxilla and alveolar processes, with all their different degrees of density, showing their structure and the presence of pneumatic sinuses.

APPARATUS.

The simplest and most convenient form for exciting an X-ray tube is a Ruhmkorf coil. This is connected with the 110-volts direct current of the electric lighting system. The current is interrupted several thousand times a minute, and each time this primary current of 110 volts is made or broken, currents of enormously high potential—a hundred thousand volts or more—are induced in the secondary coil and sent through the X-ray tube. While the voltage is very great, the amperage is proportionately small, from one to four milliamperes of secondary current being sufficient to excite an X-ray tube for most dental purposes; and fifteen milliamperes is the largest amount which any X-ray tube will carry, even for a few seconds. This exceedingly small amperage makes accidental contact with any part of the X-ray tube or wires quite harmless, although this should be guarded against because of the disagreeable spark produced. The milliamperemeter for measuring the current actually passing through the tube is a recent invention, and forms a valuable accession to the X-ray equipment.

The coil which the author is using for most of his office work was made by Wappler of New York, and gives a powerful spark twelve inches long. With this coil the author uses two types of liquid interrupter, the Wehnelt and the Caldwell-Simon. Other interrupters which can be used are the mechanical, either vibrating or by a mercury dip or jet, and these also give good results. Dr. Schamberg of Philadelphia is using a vibrating interrupter for X-ray work; Dr. G. Lenox Curtis of New York uses a motor interrupter of a special type which gives a good high-frequency current with only one or two amperes of primary current.

An amperemeter measures the strength of the primary current—about three amperes for treatment by high-frequency currents, ten or twelve for most cases of dental radiography, and about fifteen for pictures through the entire thickness of the head. The intensity of the X ray bears some relation to the strength of the primary current, and a weaker current may be used within reasonable limits if the time of exposure is correspondingly increased; or an increase in the number of amperes will shorten the time of exposure. Too weak a current will not give sufficient intensity of X ray to produce a good picture, even with an inordinately long exposure; and too strong a current presents many technical difficulties, and may even destroy the apparatus. A static machine may be used to excite an X-ray tube, and so may a step-up transformer with the proper accessories—including condensers and ventril tubes. The output of a static machine is comparatively weak, and is subject to interference by atmospheric conditions. When it does work, however, it produces an X ray of great steadiness. The outfit of which a transformer forms the basis is the latest and possibly the best type of X-ray generator. It requires no interrupter, works on an alternating current, and is as steady as the dynamos which supply the primary current. An apparatus of this type, made by Gaiffe of Paris, is rapidly coming into use in Europe.

VALUE OF X RAY IN DIAGNOSIS.

The X ray is useful in the diagnosis of every condition with which the dentist or the oral surgeon has to deal, and recent improvements in technique have made it easy to produce a picture of any part of the teeth and maxillæ, of the antrum, ethmoidal cells, and frontal sinus. A carious condition of a tooth may be shown in its incipient stage, and this fact has proved of service in cases of caries occurring beyond the attachment of the gum, or in a tooth already filled. The pulp-cavity and root-canals show perfectly well, and a pulp-stone could doubtless be readily seen if present. The X-ray picture shows how complete a root-filling is, also whether it has been forced out through an open foramen, and whether a root has been perforated while inserting a pivot. The method has demonstrated such objects as a Gates-Glidden drill broken off in a root-canal. The condition of teeth which are held in place by or from the anchorage for crown and bridge work can be seen. In cases of implanted teeth we can see the nature of the ankylosis and, as time passes, the degree of absorption which the root undergoes. A recent radiograph taken for Dr. G. Lenox Curtis shows the present condition in a case in which a carious upper lateral incisor had been extracted four years ago, and a natural tooth (preserved in alcohol), with a porcelain crown to match her own teeth, had been implanted. A fistula had remained open ever since, and now the X ray shows that the root of the implanted tooth has been almost completely absorbed. Scarcely more than a shell remains around the pivot. In addition, there is a large area of necrosis and absorption of bone, and about half of the root of the central incisor is obscured in the picture.

If there be doubt as to whether a tooth is a deciduous or a permanent one, this is settled by the X ray, and we can also see to what extent the root of the deciduous tooth has been absorbed. Dr. Schamberg has recently called attention to the fact that the X ray shows that absorption occurs even in cases in which the germ of the permanent tooth is absent, or is so misplaced that it does not press upon the root of the deciduous tooth.

Supernumerary teeth may be studied and the direction of their roots ascertained. When a tooth fails to erupt at the proper time, an X-ray examination will show whether its germ is entirely absent, or, if present, its position and relation to other teeth. The vital importance of an X-ray examination before extracting persistent deciduous molars was shown in an examination for Dr. Gillett. The young lady had the deciduous lower molar on each side extracted in Paris a year ago, the dentist not taking the precaution to ascertain with the X ray whether the permanent teeth were present. A year later the permanent teeth had not appeared, and the X ray showed that their germs were absent. It sometimes happens that an unerupted tooth is growing horizontally against the root of another tooth, and may produce either displacement of the tooth pressed upon, or the most severe pain. In the presence of either of these symptoms, an X-ray examination is called for. In a case examined for Dr. Kimball, a lateral incisor had become abducted and rotated, and the picture showed the unerupted canine pressing obliquely against the apex of its root.

Cases in the other category occur frequently in connection with the development of the third molars, and an X-ray picture is of the greatest assistance in their diagnosis, and also in deciding upon the treatment of impacted third molars, erupted or unerupted.

There is a whole class of cases of abscess about the roots of teeth, with rarefaction of bone and absorption of the apex, which are shown by the X ray. In a considerable number of cases these lesions have been found at a considerable distance from the opening of the fistula, and not always in the teeth which had been under suspicion. An examination of this kind enables one to locate the disease without wasting time in removing fillings, and otherwise working in the dark. The differential diagnosis between abscess, sarcoma, and dentigerous cyst is readily made, and fractures are accurately shown.

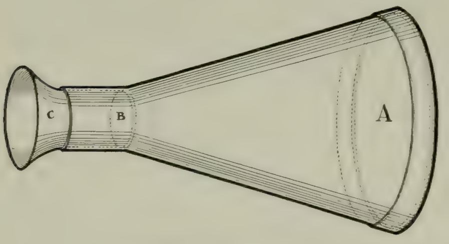
Cases often have to be examined by the X ray in order to establish differential diagnosis between neuralgia or neuritis on the one hand, and absorbed roots, impacted third molars, or abscess or tumor of the antrum, ethmoidal cells, or frontal sinus, on the other hand. Of course it is more interesting to triumphantly discover one of these anatomical lesions, but in other cases the positive assurance that they are not present is equally valuable.

MODE OF EXAMINATION.

Coming now to the method of examination: a fluoroscopic examination may be made, an X-ray picture may be taken, or both. The author's dental fluoroscope is shaped like a mouth-mirror, but instead of a reflecting has a fluoroscopic surface. It is placed in the mouth, and the X-ray tube is placed outside on the affected side. The relative positions must be such that the shadow produced by the X ray shining through the cheek and jaw will fall upon the surface of the fluoroscope. The observer looks at the image on the fluorescent front surface of the fluoroscope. He does not have to look through the fluoroscope, as is usual, though not necessary, in ordinary X-ray work.

Some manufacturers have made these dental fluoroscopes with a sheet of mica to protect the chemical surface. This renders it worthless, as mica transmits the X ray very poorly. A thin sheet of glass is the best covering, and if this is on both front and back of the fluoroscope it is still better. In this way we are able to look through it if occasion demands. The room must be darkened, and it is better to have the X-ray tube enveloped in a black paper.

A magnifying fluoroscope has just been devised by the author, and is now reported for the first time. It is constructed on the general principle of a jeweler's magnifying glass, and consists of a conical metallic box, closed at its larger end by a fluoroscopic screen two and a half inches in diameter, and with its chemical surface toward the inside of the fluoroscope. At the smaller end of the fluoroscope is a magnifying glass, with a hard-rubber flange to fit over the observer's eye in such a way as to exclude the light. This lens is at an adjustable distance from the screen. The fluoroscope is to be applied to the outside of the face over the site of the disease or injury, and the X-ray tube is to be placed on the other side of the face, though not necessarily directly opposite. For instance, in examining the mandible, it will be advantageous to have the X-ray tube placed so that it will either shine under the opposite side of the jaw, or, with the mouth open, the tube may shine over the opposite side of the jaw. In either case, the object is to get the image of the affected side unclouded by the image of the opposite side. Anyone who with an ordinary fluoroscope has tried to see fine details like the point of a needle among the bones of the wrist, will see the advantage of the magnifying fluoroscope in the study of fine details about the teeth.



Magnifying fluoroscope.

In demonstrating the dental fluoroscope, the teeth, their roots, and the surrounding bone show very much better if the vacuum be comparatively low than if a greater degree of penetration be used. With the magnifying fluoroscope a medium vacuum is best. The dental fluoroscope enables us at once to attain a perfect result in examinations for unerupted teeth, impacted third molars, dentigerous cysts, fractures, and similar gross lesions. In all these cases it is a satisfaction to make a radiograph in addition, for preservation as a record of the case. And in the cases of minute lesions of the root-canals and of the bone at the apex of the roots, the dental fluoroscope does not give sufficient detail, and its use is undesirable as adding to the duration of exposure to the X ray.

In every department of X-ray work the use of the fluoroscope is to be avoided except in cases which can be diagnosed at a glance. A radiograph takes only a few seconds of exposure, produces an image many times more distinct than the fluoroscope, and can be studied for any length of time without danger to the patient. The magnifying fluoroscope is likely to prove especially useful in cases of impacted third molars and unerupted teeth in anomalous positions.

METHODS OF MAKING RADIOGRAPHS.

One method of making a radiograph of the teeth is by means of a small film wrapped in black paper, and protected by rubber or paraffined paper. This forms a packet containing two films, measuring about one and one-quarter by one and five-eighths inches. The film may be the ordinary kodak film or the heavy celluloid film with a triple coating of process emulsion (the slowest emulsion), made by the Seed Company, or, what is very convenient, the positive kinematograph film put up in these little packets especially for this work by the Eastman Company. The film is held inside the mouth close against the inner surface of the affected teeth, and against the inner surface of the gum and roof of the mouth in the case of upper teeth. In the case of lower teeth it is pressed well down into the floor of the mouth, while held in a plane parallel to the long axis of the teeth in question, and pressed close against them. The X-ray tube is placed about ten inches from the opposite side of the face, at such a level that the image of the teeth cast upon the film will be of about the actual length of the teeth themselves. The angle at which the tube must be placed varies in different cases, according to the flatness of the roof of the mouth and several other conditions. If the tooth be vertical, the angle at which the tube is placed above the horizontal must be half the angle between the film and the vertical line of the tooth.

Practice enables one to judge of the proper angle quite readily by the eye alone. A picture made in this way presents the very best definition obtainable. It should show the exact extent of the layer of enamel, the root-canals, the peridental membrane, the structure of the jaw and the alveolar process, and any abnormality. There are certain disadvantages: the film usually has to be held in position by the operator, and this repeated exposure to the X ray day after day is dangerous to the operator's hand; pressing the film far enough down to show the apex of the roots hurts more or less and is very difficult for the lower incisors, on account of the frenum linguæ; and only two or three teeth can be shown on one film.

Another method has been rendered practicable by a little device of the author's called a film-carrier and indicator. A film measuring two by two and one-half inches is placed horizontally in the mouth, and the patient closes his lips and teeth upon it. The film is in a film-carrier, to which is attached an indicator which can be turned to any tooth on a printed diagram on the film-carrier. The pointer then shows the place where the anti-cathode or central disk of the X-ray tube should be placed, in order to obtain a true picture in which the particular tooth in question shall form the central figure. The picture is practically a full-arch picture, and takes in the whole roof of the mouth or the entire width of the mandible, as the case may be. It is a much easier and pleasanter method than the other, and shows the relations of the teeth so much better that the author takes one picture by this latter method, even if another is also made by the first method, which up to the present writing has given somewhat better detail.

The film-carrier could scarcely have been dispensed with in a recent case examined for Dr. Cudlipp; the patient was a boy of nine with unerupted lower central incisors. A small film was used, but could not be pressed down far enough to make sure that the germs were absent. By the use of the full-arch method this was easily accomplished. By either of these methods disease of the antrum may be diagnosed, and both are useful in determining which roots penetrate into the antrum, as well as those which have been diseased.

RADIOGRAPHS OF THE HEAD: STEREOSCOPIC PICTURES.

Radiographs of the entire head taken in a lateral direction have been made by Dr. Kassabian of Philadelphia, for use by Dr. Cryer in his excellent article on the X-ray study of facial anatomy ("Some Uses of the Roentgen Rays in Studies of the Internal Anatomy of the Face," COSMOS, vol. xlvii, 1905, page 1), and have been made by the author and others in examinations for disease of the antrum, ethmoidal cells, or frontal sinus, and in some cases of fracture or impacted third molars and anomalous teeth, as well as, of course, for tumors of the brain and injuries to the skull. This is a valuable means of diagnosis in certain cases. But as the images of the two sides of the face are superimposed, the author has never been entirely satisfied with pictures made in this way.

The very best radiograph of this general class, however, is obtained by antero-posterior exposure. Beautiful pictures of this class have been made in Germany during the last year, and also by Dr. Caldwell in a series of cases examined for Dr. Coakley. One or two by the present author shown tonight will suffice to show the advantage of the method. We seem to be looking at the front of a transparent skull. The shape and size of the frontal sinus are shown, and so are the ethmoidal cells and the two antra; the orbits and the nasal fossæ with their turbinated bones; the mandible with its body and ramus, its alveolar process and complete set of teeth, and the upper teeth with the bones of the face.

In taking one of these pictures the tube is placed behind and the plate in front of the head. The making of stereoscopic radiographs requires a knowledge of technique the discussion of which would carry me beyond the scope of the present paper. Suffice it to say, however, that this picture can be easily and safely made by anyone who knows the X ray from A to Z, and gives the necessary time to the study of this special branch of the work. This picture was made with an exposure of only a minute, and with the tube at a distance of twenty-four inches from the plate.

Bromid paper may be used instead of celluloid films within the mouth; the exposure must be of about fifty seconds, and the pictures may be developed, fixed, and mounted without a dark room inside of five minutes. The definition is not nearly so good, but the method is available for such gross lesions as unerupted teeth.

Stereoscopic pictures may be made by any of the methods described above. The tube is shifted about three inches to one side after making the first picture, and care is taken not to move the patient's head and to place the second film or plate in exactly the position occupied by the first. For the radiograph of the whole face a stereoscopic plate-holder is a necessity. The first plate may be withdrawn and the second slipped into it, while the patient's head still rests upon the upper surface of the plate-holder. Two pictures made in this way may be looked at with a small stereoscope held in the hand, and the two prismatic lenses make the picture appear like one, with the perspective showing the different parts in relief. Such a picture is especially useful when the question arises as to whether an unerupted tooth lies toward the lingual or the buccal aspect of the jaw.

MEASURING THE INTENSITY OF THE X RAY.

The author is rejoicing in his invention of a practical method of determining the strength of the X ray applied in examination or treatment. With a record of the intensity and the quality of the X ray, with the distance from the patient and the duration of the exposure, it is possible to obtain definite results, and that with safety. The method of measuring the intensity of the X ray consists in using an ordinary fluoroscope and some heavy metallic object such as a bell—held at different distances from the X-ray tube until it is ascertained how far the X ray will carry and produce visible fluorescence. The distance in meters, practically the same as yards, gives the intensimeter number. "Intensity 13" (Tousey) would mean that the operator holding a fluoroscope to his eye at a distance of thirteen meters could just see the fluorescence excited in the barium-platino-cyanid screen. The quality of the ray has always been easily determined by the number of thicknesses of tin foil, or aluminum, or platinum the X ray will shine through. This degree of penetration is independent of the intensity of the ray. The former is qualitative and the latter quantitative. The author's intensimetric scale makes it possible for an operator in any part of the world to record an exposure for treatment or examination by a simple formula, as—

> Penetration 6 (Benoist). Intensity 13 (Tousey). Distance 30 centimeters. Time 3 minutes.

This is a typical application for the treatment of a deep-seated cancer, and could be duplicated by anyone with any type of apparatus.

The author records these and many other facts about every exposure, and has found the intensimetric scale indispensable. Should it come into general use it will make the recorded observations of men all over the world available as a guide. At present the record of a treatment is very apt to be simply "exposure 10 minutes." No one else should treat a similar case by 10-minute exposures without first finding out the comparative intensity of the ray from his own apparatus and from that of the reporter of the case.

For radiographic work the tube and the current should be regulated to give an intensity commensurate with the thickness or density of the part to be depicted. Intensity 12 (Tousey) is the lowest intensity which the author would select for a radiograph of a thin, readily penetrable part; and intensity 14 to 16 (Tousey) is desirable for the most difficult pictures, like antero-posterior ones of the head, or those of renal calculi. The best degree of penetration is—roughly speaking—for each half inch of flesh, one thickness of tin foil weighing an ounce to one hundred square inches.

PRECAUTIONS IN THE WORK.

Precautions taken in the use of the X ray make it entirely safe for both patient and operator. One of these is having the tube enveloped in a Friedlander shield, opaque to the X ray except at a certain part where an opening is directed to the part of the patient to be examined or treated. Another is restricting the total time of exposure at any one sitting to a figure well within the limits of safety. Two or three exposures of ten seconds to an intensity of 12 (Tousey) might be made on small films at the same session and also a picture of the entire head with an exposure of sixty seconds to an intensity of 15 (Tousey). Or a greater number, five or six, of the smaller pictures may be made of different parts of the mouth, if no long exposure is made on the same day. Another precaution which is required in certain cases is the use of what the author calls his "screen for soft rays." This is a sheet of tin foil, as used by the author for the past year or—as recently suggested by Dr. Pfahler—a piece of sole leather, through which the X ray must pass before reaching the patient. An X-ray tube sends out X rays of several different wave-lengths, and such a screen will absorb the portion which otherwise would be absorbed by the skin, and which might cause irritation if a long application were required, as in the treatment of cancer. Such a screen is seldom required in making X-ray examinations.

THE X RAY IN CANCER AND PYORRHEA ALVEOLARIS.

The X ray has marked curative properties in cases of cancer, those of the mucous membrane being susceptible of permanent cure, while those of the deeper structures are held in check, and some are cured. The limits of the present paper will not permit of more than this passing reference, though the subject itself is of the greatest importance and interest.

The treatment of the class of cases covered by the names of Riggs' disease, pyorrhea alveolaris, interstitial gingivitis, etc., by the X ray and high-frequency currents is part of the subject-matter of this paper. The apparatus employed in different cases includes an ordinary X-ray tube in a Friedlander shield, the author's special X-ray tube, a unipolar X-ray tube, and a variety of vacuum electrodes connected with the Oudin resonator or high-frequency apparatus. Perhaps the best idea can be given by a description of the treatment in an actual case:

The patient, W. H., a man of thirty-one, was referred to me by Dr. Leo Green, April 6, 1905. At that time several of the upper and lower teeth were affected.

The condition had occurred on a previous occasion, and had been relieved through treatment by the usual dental methods, only to recur about six months before the X ray was resorted to. During the six months ordinary dental treatment had been powerless to give relief. The gums around the affected teeth were red, swollen, and ulcerated. They bled on the slightest pressure, and were very painful. The teeth were not as loose as in a good many cases of this character. A part of each treatment consisted in the application of the X-ray tube in a Friedlander shield; the intensity was 10 (Tousey); the penetration 5 (Benoist); the distance from the anticathode to the patient's face 12 inches (or 31 centimeters); and the time of exposure 2 minutes. The patient showed his teeth more or less, but no retractor was used to expose the gums. The ray passed right through the lips. The second part of each treatment was the application of a vacuum electrode to the gums for six minutes, with a high-frequency current of 75 milliamperes. These treatments were repeated twice a week for four weeks. When he came to the office for the second treatment, he reported that the pain was entirely relieved, the swelling of the gums was less, bleeding almost gone, and the ulceration less visible. On April 21st, after two weeks' treatment, Dr. Green reported that some parts were entirely cured, and the whole mouth was in a better condition than at any time for the preceding six months. On May 4th there was still some redness and raggedness of the edge of the gums around one tooth, but there was no tenderness even at this point. Everywhere else the mouth was apparently completely well. The last treatment was given May 11, 1905, and the patient left apparently cured. Dr. Green reports now—October 11, 1905—that the cure has been permanent thus far.

The feature of this treatment to which especial attention is called is the fact that it is valuable as an adjunct to the regular dental treatment—scaling of the roots and disinfection of the pus pockets. It is in no way suitable as the sole treatment of these cases, but as an accessory means it gives prompt and wonderful relief. The opinion of the present author, based on his own and the reported experience of others, is that it is beneficial in every case, and will probably permanently cure a certain proportion of cases. He cannot yet point to any case of his own which, having been systematically treated and cured, has remained under observation long enough—say two years—to justify the positive assertion that it will effect a permanent cure. He can say positively that it can be safely applied, that it gives immediate relief in every case, and except in exceptional cases produces an apparent cure, which he hopes time may show to be permanent.

The only unsuccessful case was that of a young lady from Mexico, a patient of Drs. Howe and Wheeler, who was anemic, and led an extremely sedentary life. In her case the progress was most favorable at the beginning of the treatment, but although it was persisted in long enough for a thorough trial, there still remained looseness and tenderness of the teeth. While the ulceration of the gums had healed up, the gum margins around the affected teeth remained thickened, pale, and cartilaginous, and looked as if they would not bleed even though they were cut with a knife. The local treatment was abandoned, and fresh air, exercise, and tonics were ordered. The fresh air and exercise the patient could not be made to take, and Dr. Howe tells me that she is probably going to lose the affected teeth. Attention to the constitutional condition is very important in these cases.

ABSTRACTS OF RECENT REPORTS UPON THE TREATMENT OF PYORRHEA BY MEANS OF THE X RAY.

The following abstracts of reports upon the treatment of pyorrhea alveolaris have appeared since the publication (in the *International Dental Journal* for July 1904) of the author's article read before the New York Institute of Stomatology:

FRANCIS LEROY SATTERLEE, M.A., N. Y. (*Dental Surgeon,* 1905, page 226).

Mr. Satterlee, in speaking of the most recent application of X-ray science in dentistry, says of the treatment of pyorrhea alveolaris by means of X rays, bi-ultra-violet rays, and high-frequency currents: Up to a very recent time radio-therapeutics was considered to be of no practical value to the dentist, but now there are indications that seem most promising to the dental practitioner. In the Cosmos of 1903 there was an article by Dr. Charles Parker of Chicago on the treatment of pyorrhea alveolaris by means of high-frequency currents and the X rays. In this paper Dr. Parker claims great results, but states that the X ray alone will not cure pyorrhea alveolaris. His treatment consisted of applying the X ray alone for about two minutes, following it up by high-frequency currents from a large electrode placed over the patient's mouth. He first used a spray of aconite, iodin, myrrh, and wintergreen. This mixture, he says, is carried into the gums and tissues by the high-frequency currents. . . . At the college we gave this treatment many trials with good results, but found that there were ways of improvement. After much experimenting, I devised a vacuum electrode that can be placed directly in the patient's mouth in contact with the gums over the diseased teeth, and another electrode to be held in the hand, thus getting a circuit of the high-frequency currents through the body, actually setting up cataphoric action, and at the same time bathing the gums in the rich radiation of the bi-ultra-violet ray. A solution of adrenalin chlorid is used in place of the iodin mixture. The purpose of this solution is to blanch the tissues, both on the surface and internally, in order that the bi-ultra ray may not be impeded in its passage through the tissues. This treatment, in combination with the X ray, has proved very successful in a number of cases, and in the early stages of pyorrhea, when the alveolus has not been entirely sloughed away, we may claim a complete cure, the teeth tightening up and the gums returning to a healthy condition.

WESTON A. PRICE, M.D., Cleveland (*Archives of Electrol. and Radiol.*, 1904, page 76).

It is doubtful if any field for the therapeutic application of the Roentgen rays is more encouraging and promising of good results than the treatment of what is commonly called pyorrhea alveolaris or "Riggs' disease." His first case had been subjected to six exposures with fair results. The second case, a man about fifty, had been troubled for five or six years, the upper right lateral had been loosened and lost, the canine adjoining was sore and loose, and its alveolus was the source of a profuse flow of pus; the centrals were badly affected. A test was made of this case. Deposits were readily removed from the teeth, and the worst tooth was exposed to the X ray, the rest being protected. A number of treatments were made from one to two weeks apart, with the result that the pus rapidly disappeared from the upper canine, the gum rapidly changed to a pinkish white, and the thickening was reduced to a normal gingival margin. Around the lower canine no improvement could be detected. Final results were satisfactory, no recurrence (after nine months) of pus or any typical symptoms appearing around the teeth treated, but the lower canine, which had been protected from rays, was still tender to pressure, and from its alveolus pus was still flowing. The upper centrals were partially or wholly exposed during treatment, and while their condition was not aggravated to start with, they, too, were materially improved.

Encouraged by these results, Dr. Price tried some unpromising cases.

The third case was a woman, age sixty, stout, rheumatic; it was a severe case. Treatment was given once or twice a week with satisfactory results; pus almost entirely disappeared, and the gums became quite normal.

The fourth case was that of a woman suffering from acute pain; the right molar was the seat of an abscess and the case was considered hopeless. It was treated only for observation of symptoms. Sixteen treatments were made and she was greatly improved.

Several other serious cases were treated, but as the experiment was not fully carried out the results were uncertain.

Method. To protect the patient, use an opaque cloth and cut a hole "in the blanket of it;" with it cover the patient's head, with the hole over the mouth or part of the mouth. "I am using a very small, specially designed tube right against the tissues, with a relatively small volume to allow for the difference in the distance." This tube is supposed to simplify and facilitate the technique of the applications, as with it the teeth can be treated from the inside as well as the outside. Cleanliness of the pockets of the teeth must be insured, and suitable washes and sterilizing solutions should be liberally used. Precaution must be taken for protecting the patient's lip and hands from the effects of the rays, as all tissues are more or less influenced by the rays under continued exposure. Both the patient and the operator should be carefully protected.

WM. H. G. LOGAN, M.D., D.D.S., Chicago (*Dental Review*, 1903).

Dr. Logan, after giving instruction for a thorough cleansing of the teeth, gives the following caution: Clean only from two to eight teeth as a beginning, for where extensive deposits have been removed from a number of teeth at a time, the roots and peridental membrane are painful when exposed to thermal shocks, while if only a few are exposed, the discomfort is reduced and better results ensue from the treatment. After experimenting upon the teeth of dogs, and not to his satisfaction, he experimented upon his own gums, and after a few months of investigation concluded that the X ray could be used in the treatment of pyorrhea alveolaris of long standing. After from three to six exposures, the patients were relieved of the gnawing pain and sore feeling characteristic of that disease, and with but one exception all the patients (number not stated) at the end of three weeks' treatment were much better. The gums had recovered their normal color, though in no case did he rely upon the rays alone to combat the process, but employed also medical treatment.

The technique of exposure was as follows: The Crookes tube was excited by a coil capable of producing a 12-inch spark; the tube used was neither hard nor soft, but of medium vacuum, the distance from the anode to the mucous membrane was from eight to twenty inches. An adjustable lead screen thirty inches square—suspended on wooden uprights, with a three-inch circular opening in the center that could be decreased at the will of the operator so that the ray would fall on the desired area—was placed between the part treated and the tube. The position of the tube and that of the patient must be such as to insure the best rays striking the diseased tissue. In no instance allow the rays to pass through the lips or cheek, as severe X-ray dermatitis will follow. If the pocket is extensive or on the lingual side of the tooth, a higher tube should be used and the tongue should be protected with lead foil, held in place by the operator. From one to four treatments a week should be made, and duration of each exposure should be from four to six minutes.

Dr. Logan does not make any positive statement as to the ultimate position of high-frequency currents and radio-therapy in the treatment of pyorrhea alveolaris, but does affirm that under this form of treatment his case was temporarily benefited.

M. I. Schamberg, M.D., Philadelphia (*Dental Digest*):

"Pyorrhea alveolaris, being a pathological condition which frequently responds but slightly to well-directed treatment, is one of the diseases which we as dentists are most anxious to favorably influence through the medium of the X ray. For that reason it is not surprising that a number of practitioners are now experimenting with the treatment of this disease by radio-therapy. Personally, my work in this direction has been so limited that I am not prepared to offer any conclusions. In the few cases that have come under my care but one or two X-ray treatments were applied, and I am not satisfied that the improvement which followed was as much due to the X-ray treatment as to other local and constitutional measures instituted in these cases."

Dr. M. L. Schmitt (abstract in *Dental Register,* 1904, page 584).

A woman over forty years of age with a bad case of pyorrhea alveolaris. All teeth were loose and deep pockets were formed, especially on the molars; the gums were receding. Dr. Schmitt banded the teeth and removed the deposits. Exposures to the X rays were then begun. In a few weeks conditions began to improve, the soreness disappearing and the teeth becoming firmer. Pus ceased to flow, the receding gums came down to normal condition, and the pockets all closed up. "No drugs were used of any kind, either locally or internally; nothing but X rays."

In describing the lantern slides and the apparatus which are now to be demonstrated the author will try to supply some of the explanations which if written out in full would have made this paper unreasonably long.

DESCRIPTION OF LANTERN SLIDES.

Fig. 1 represents the use of the dental fluoroscope. The X-ray tube is placed near the affected side of the face, and casts an image of the teeth upon the fluoroscope, which is held inside the mouth like a mirror.

Fig. 2 is a lateral radiograph of the face, and was taken with the mouth open. The teeth are shown on this side of the face, and the sphenoidal cells show very well; also the frontal sinus. When you come to the antrum, it is easy to make a correct diagnosis from a single lateral exposure, providing that the suppuration is upon only one side. If you had a molar lying in a horizontal direction and causing pain, it would show very well.

FIG. 1.

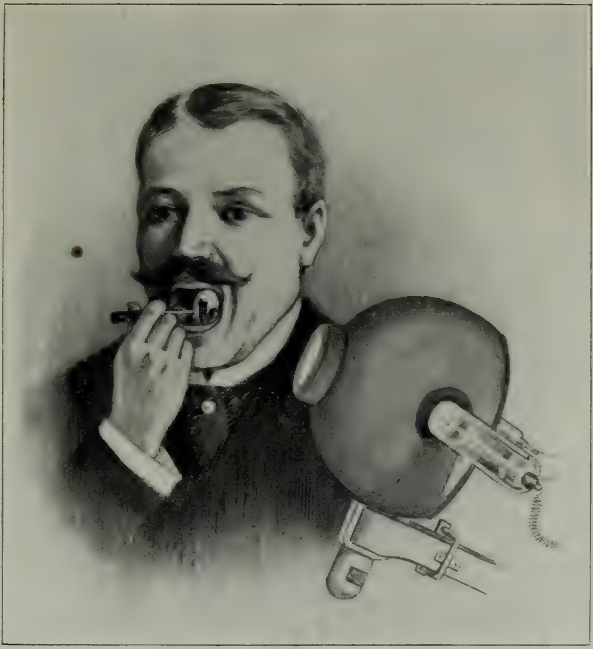


FIG. 2.

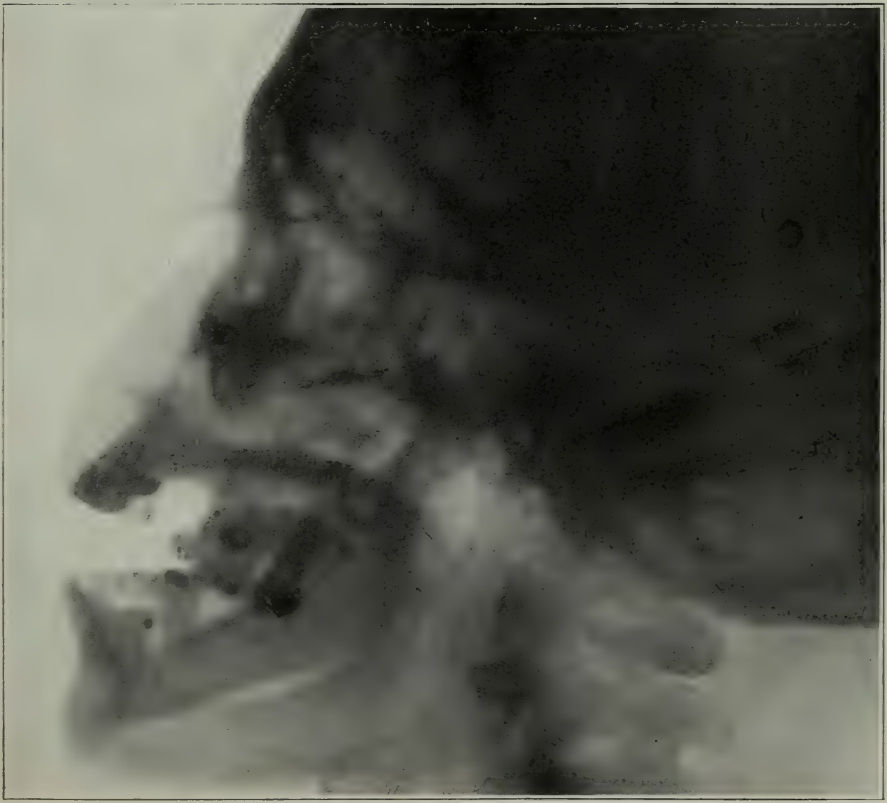


FIG. 3.

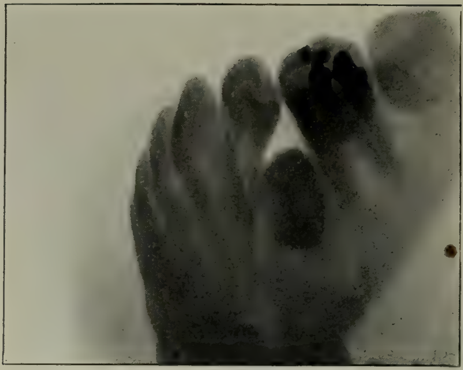


FIG. 4.

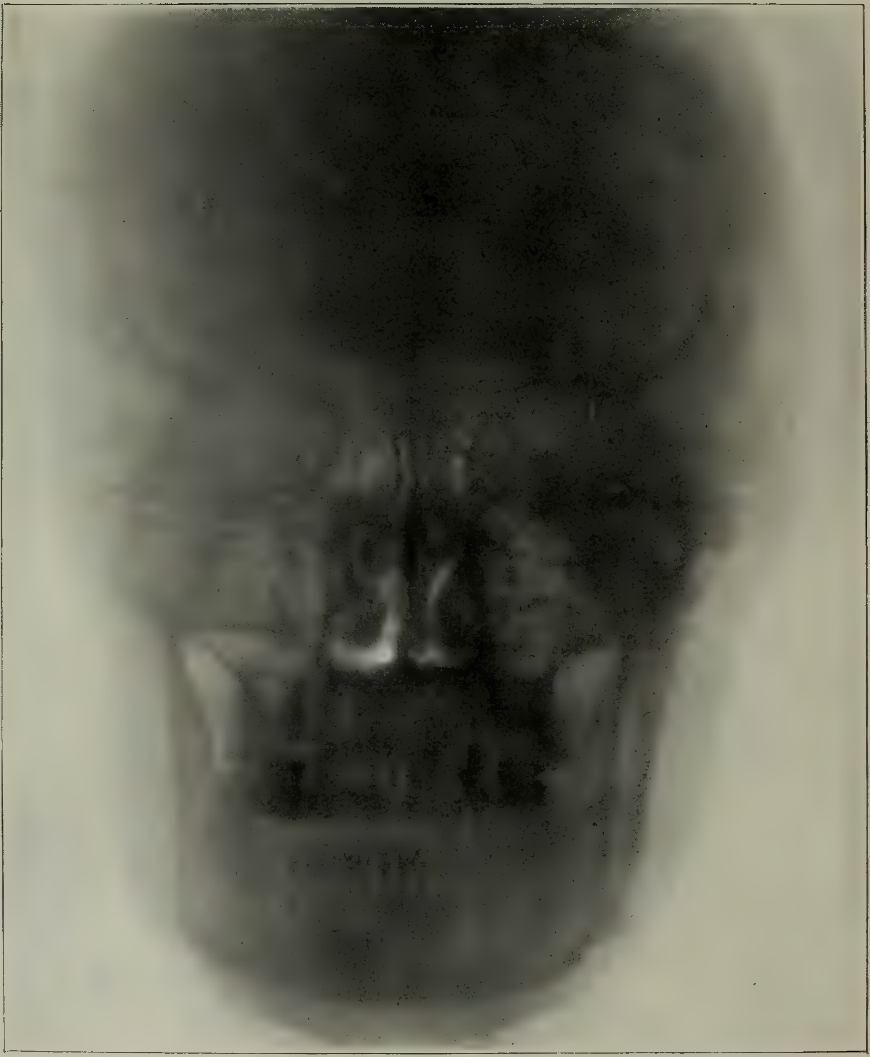


Fig. 3 is a picture made with the horizontal film-carrier. It shows an unerupted tooth. In this particular case the absent tooth was supposed to be a first bicuspid. The bicuspid which was present was a large and strong tooth, and it was supposed that the missing one must be the first. The X ray shows that the missing tooth is there, but it is a second bicuspid, so the separation that should be made was between the molar and the bicuspid, instead of between the bicuspid and the canine as had been expected.

Fig. 4 is from a case where I made an examination for antral trouble, but did not see anything to suggest the presence of pus or disease in the antrum itself. The X-ray tube was behind and the photographic plate in front of the head.

Fig. 5: Here is one of those cases of unerupted teeth. It shows the apical foramen. This is a young person, and it shows the peridental membrane, the root-canals, and the bones. I brought it because it shows especially well the layer of enamel on these teeth.

FIG. 5.

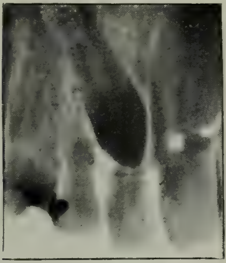


Fig. 6: The radiograph is of a case of fracture of the mandible with necrosis and fistula. An operation was required to remove the dead bone.

FIG. 6.

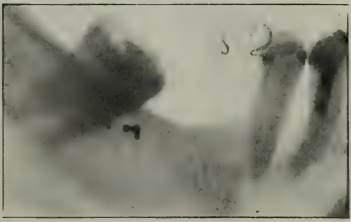


Fig 7: This picture which is to be passed around was taken by the film-carrier, and shows how well we reach the apices of the roots. In some of these pictures can be seen a wonderful amount of detail in the roof of the mouth. This is a case in which one of the little films did not show the condition as well as one of my large films. The case was one of suppuration in the antrum.

FIG. 7.

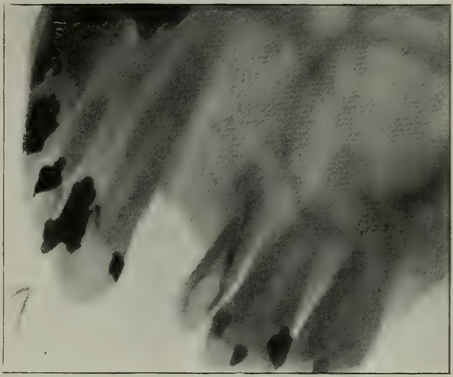
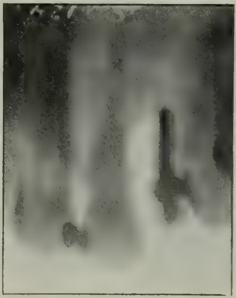


Fig. 8 is of a recent case of Dr. G. Lenox Curtis', one which I referred to, where an implanted tooth put in by a dentist some four years ago—a natural tooth, but not the patient's—had a porce-

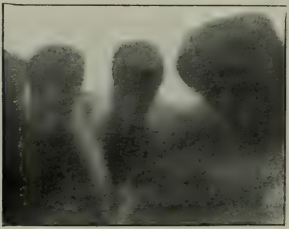
FIG. 8.



lain crown to match the patient's own teeth, applied on a pivot. All this has been carried away by suppuration. There is even a considerable area of necrosis around, with absorption at the end of the incisor.

Fig. 9: This is a picture of a case of fracture of the jaw followed by a fistula.

Fig. 9.



It shows the fractured root of that tooth as well.

Fig. 10: This was a case in which the horizontal film-carrier was used. There were unerupted canines and persistent deciduous lower central incisors. The radiograph showed the absence of the germs of the lower permanent centrals.

Fig. 10.

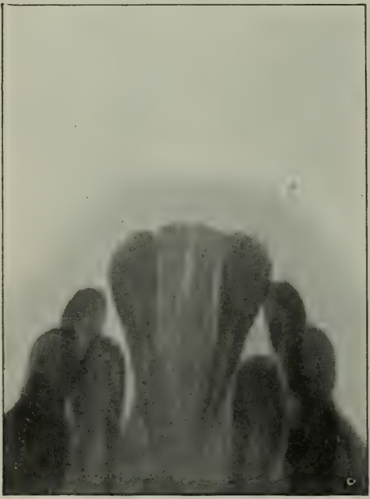


Fig. 11: This radiograph was taken to determine whether the tooth was a temporary or a permanent one; and if temporary, whether the germ of the permanent tooth was present or absent. It proved to be a temporary tooth, and there was present the germ of the permanent tooth.

Fig. 11.

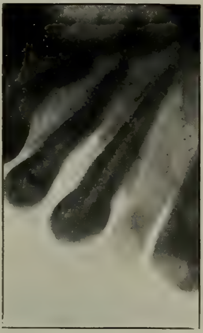


Fig. 12: In this case there was a chronic abscess about the roots of an upper first molar, not involving the antrum.

Fig. 12.

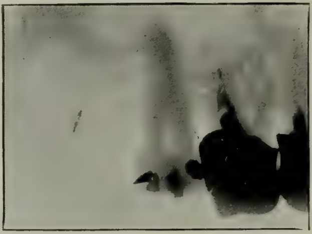


Fig. 13 is of an old lady of seventy-five, and was taken to determine the stability of the teeth shown in the picture. They are evidently secure for the rest of her life. The root of the first bicuspid is beautifully filled.

(Dr. Tousey mentioned the fact that he usually makes a radiograph when beginning the treatment of a case of pyorrhea, and that it shows the extent to which absorption of the alveolus had taken place. He did not think this would be likely to be reproduced as a result of X-ray treatment, although improvement would take place in other ways.)

FIG. 13.

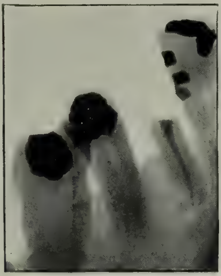


FIG. 14.

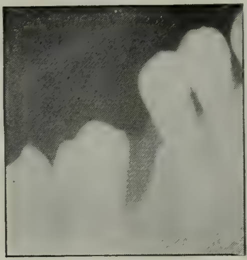


Fig. 14 was taken directly upon bromid paper, in order to discover the cause of persistent pain in the region of the second bicuspid. This method does not give as much detail as a celluloid film, and the present picture does not reveal the cause of the trouble positively, although there is a suggestion of swelling and irregularity at the apex of the root.

SOME LESIONS OF THE MOUTH WITH WHICH THE DENTIST SHOULD BE FAMILIAR.

By HENRY C. BOENNING, M.D., Philadelphia, Pa.,
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SURGEON TO THE GARRETSON HOSPITAL, ETC.

(Read before the Southern Dental Society of New Jersey, March 20, 1906.)

IT is a fact in the dental profession that too often the dentist is content with an intimate knowledge of the anatomy, physiology, and functions of the teeth alone, and of their treatment in all pathological conditions by both drugs and mechanical means. It is only now and then that the dental practitioner retains an accurate knowledge of the anatomy and relations of the different structures of and within the mouth, and it is even less frequently the case that he is able to diagnose the various lesions that appear about and within the oral cavity.

It has been my aim with the classes in oral surgery at the college to train the students to a quick perception of any anomalies or pathological conditions within the mouth. With this in view, I have often selected members of the class to indicate to me what they saw when a patient opened his mouth. This habit of critical observation on every patient whose mouth is examined will give a remarkable training for the quick detection and accurate estimation of any abnormal or diseased condition that may be present.

To know the abnormal, it is of course essential to have a knowledge of the normal condition of the mouth, and to this end I would suggest that you cultivate the plan of observation just referred to, proceeding after a regular progressive manner from the lips to the posterior wall of the pharynx. A glance at the lips of a patient will indicate to you very often the recent health of the patient. Thus the presence of herpes or fever blisters may indicate that the patient has recently passed through some mild form of illness. A fissure of the lip, about the middle, especially during cold weather, will be an admonition to you not to open the mouth unduly, inasmuch as some irritable ulcers of this type are extremely painful, and limit dental operations to the merest necessities until the fissure is healed. The presence on the lower lip of a circular, crater-like ulcer with a hardened base, with lymphatic involvement beneath the jaw, may be a labial chancre. Lips that are pale often indicate an anemic condition.

The space between the oral surface of the lips and the teeth in front is known as the vestibule. Under normal circumstances there are no accumulations in the lower sulcus; in certain forms of stomatitis the vestibule may be covered with blisters and patches, or it may be intensely red, as in excessive smokers and tobacco-chewers.

Omitting any reference to the teeth, we next glance into the cheek pouches, which are the intervals between the cheeks and the molars and bicuspids. We observe the opening of Stensen's duct, about on a level with the upper second molar. If we should find an extensive flow of mucus we would probably inquire into the abnormal activity of the parotid gland, and whether mercury had been recently used, either for long-continued constitutional use, or in the form of that much abused but excellent remedy, calomel, to such a degree as to cause ptyalism. The cheek pouches under normal circumstances are free from the accumulation of any material, such as food products, and where such food products have accumulated careful inquiry should be made to ascertain why the buccinator was defective in power; for one of its functions is to press the food between the teeth, and keep it there during mastication, the counter pressure by the tongue within the mouth being sufficient to adjust the particles of food, and thus retain the non-masticated food between the grinding surfaces.

Looking into the anterior part of the oral cavity, the tongue is seen lying on the floor of the mouth, its apex resting against the lingual surfaces of the incisors, its base opposite the third molar, the frenum of the tongue being opposite the first bicuspid, under normal conditions.

In the act of swallowing, the tip of the tongue is placed against the lingual surfaces of the upper incisors; a wave of muscular contraction—passing from the tip to the base of the tongue—takes place, the dorsum of the tongue approaches the roof of the mouth, thereby forcing the bolus backward until it is pushed through the anterior faucial arches into the pharynx, there to be acted on by the involuntary muscles of deglutition and passed to the stomach. In shape the normal tongue is triangular, unindented, and its apex bluntly rounded. A few of the congenital defects of this organ are quickly noticed. Thus, the tip may be bifid, a condition sometimes called serpent tongue, or it may be comparatively immobile, due to shortening of the frenum, or the tongue may be preternaturally mobile. There have been cases having the frenum so long and relaxed that the patient could place the under surface of the tip of the tongue behind the soft palate. At a glance the practitioner can see by the appearance of the tongue whether the digestive apparatus of the patient is in good order. Thus we have the broad, flat tongue with tooth-markings at the sides in chronic dyspeptics; the reddish dry tongue so often seen in lithiasis, and such cases are frequently the victims of serumal calculus. Fissures on the tongue are often indicative of specific diseases, and when associated with a hard firm mass in the substance of the tongue, especially if this occurs in a patient over fifty years old, hard cancer is a strong probability.

Some secondary lesions of syphilis are often manifest at the sides and under surface of the tongue in the form of mucous patches, at first appearing as a white, filmy deposit, but soon becoming thicker and gray in color, and more or less fissured.

It is of the most vital importance that the dentist should be able to recognize these evidences of a serious constitutional disease, for the discharge from these patches is virulently poisonous. I have during my professional career treated many dentists who have become infected from the mouths of patients with syphilis, the initial lesion being about the finger or the hand, the bubo above the elbow or the armpit, and later on followed by the lesions of the different stages of this dreadful disease. I have at this moment under treatment a dentist who operated upon a patient with mucous patches of the mouth. This was a year and a half ago. At that time he accidentally abraded his finger while adjusting a rubber dam. When he consulted me last January, he was covered with a most offensive rupial syphiloderm.

Among other highly contagious diseases is diphtheria. There are some patients who have this disease in a relatively light form, with the diphtheric membrane but little in evidence. And yet these cases are as actively contagious as are those where the evidences of diphtheria are profuse. In diphtheria there is at first a faint white coating over the faucial arches and the velum, while in syphilis the mucous patches are generally at the sides of the tongue.

The roof of the mouth may often give much information to the dentist. Most thorough examinations should be made where any abnormality is noticed, also where the patient is about to receive an artificial denture. Where everything appears to be firm and smooth, and a plate is put into the mouth and fits perfectly, the patient is often discharged, without admonition from the dentist to return for further inspection. Occasionally such a patient will return to the practitioner with the remark that "the plate has warped," and "no longer fits comfortably." In such circumstances make a most careful examination of the hard palate, and remember that syphilis in its early tertiary developments often causes gummatous infiltration, thereby changing the contour of the roof of the mouth and displacing the plate. Sometimes cartilaginous nodules develop along the rim after extraction, especially if the plate has been put in position before complete alveolar absorption has taken place.

Ulceration of the roof of the mouth is a very common occurrence, and is occasionally the result of undue pressure by a badly fitting plate. I have seen a number of cases where the erosion and ulceration conformed to the shape of the vacuum chamber. In such cases a persistent process of ulceration occurs; one that is difficult to cure. Generally the reason of this undue pressure is not in any fault of the plate but is due rather to the varying absorption of parts of the hard palate, such as the rim. It is to be remembered that absorption of all the parts is never uniform.

What is of very great importance to the dentist is the early recognition of ulceration due to syphilis, for this disease has an especial predilection for such bones as are invested by highly vascular periosteal and other tissue. Hence syphilitic disease of the hard palate, of the bones of the maxilla, and those of the cranium, is a frequent late manifestation of the disease. Syphilitic ulceration of the tissues of the palate is preceded by inflammatory changes; very often infiltration takes place between the bone and the periosteum. These gummatous infiltrations intercept the nutrition to the bone, and caries and necrosis take place, followed by perforation of the hard palate. Where cases of this kind are encountered, the dentist should advise an immediate and active line of treatment, inasmuch as when it is established, this specific process may rapidly destroy the entire osseous structures of the palate and nose.

In the examination of the mouth the floor should not escape a close scrutiny, for often ulcerative troubles are found below the tongue. There may be stoppage of some of the ducts of the sublingual gland, and an oblong translucent tumor known as ranula then develops. Such a tumor is present occasionally without the patient knowing anything about it, and the observant dentist who discovers it will add to his reputation by indicating its true nature.

The velum and faucial arches are very often seen to be inflamed. The common sore throat that people complain of in the changing seasons of the year is merely a mild faucitis. Destruction of the velum, and especially of the uvula, is common in the latter part of the secondary stage of syphilis, and when it occurs is almost always associated with mucous patches at the sides of the tongue. Between the anterior and posterior arches of the fauces are the tonsils. Often, as the result of successive attacks of inflammation, they become greatly enlarged, hypertrophied, and indurated. Under such circumstances they may interfere with nasal respiration, and such a patient will acquire the habit of sleeping with the mouth open, breathing through the mouth instead of through the nostrils. Such breathing is detrimental to all the oral structures. The pharynx, against which you look when the mouth is wide open and the tongue somewhat depressed, is frequently affected by diseases, inflammatory, ulcerative, and suppurative.

In referring to these post-oral suppurative conditions, I do so for the express purpose of developing the fact that many of the troubles of the alveolar structures following extraction owe their existence to the presence of pus in the post-oral parts, which may infect the sockets or any abrasion about the gum. This may give rise to abscess of the jaw, followed by caries of the bone, necrosis, and all the attendant conditions, and sometimes by blood poisoning. The dentist who performs work under such conditions, and has infection of the bone as a result, will probably be sued for damages or worse. Our courts have many cases against dental practitioners and practitioners of medicine for damages, and in most of the cases there is no foundation or reason for bringing suit except the criminal cupidity of some unscrupulous attorney for a fee. The way to avoid such legal complications is to treat all your cases, at all times, not only with the highest dental skill, but after the manner of practice of the best surgical authorities of the day. The dentist and the surgeon of today must practice on the lines of the most advanced antisepsis, or they will probably get into trouble. If in any case you can show conclusively that you know how to sterilize all of your instruments and anything that comes in contact with the mouth of the patient, and that you have so sterilized everything concerned in the operation before performing any dental operation, that the area of operation is sterile, made so by, let us say, hydrogen dioxid followed by a five per cent. boric acid solution, and after the operation have advised such a patient to return for further examination, placing in his or her hands remedies suited to maintain oral sanitation, you may go to court confident of winning your case, no matter who may testify against you.

Among the congenital defects that will be brought to your notice is the horrible deformity of cleft palate. Hare-lip and cleft soft palate in various degrees of intensity are quite common. Hare-lip may be single or double, complicated by complete fissure of the hard palate and cleft of the soft palate. Sometimes patients in whose families such defects have occurred are much concerned lest they may occur in other of their children. You may be consulted under such conditions by some pregnant woman, who is apprehensive lest this most dreadful congenital deformity may be reproduced in her child. She may state that she has been greatly shocked by seeing some such horrible case, and hastens to be advised whether such a mental impression is likely to be to the prejudice of the developing child.

There was a time in my professional life when I laughed at the effects of maternal impressions upon the embryo, but I have seen enough cases to convince me that there is some basis for the belief that a strong maternal impression can modify the cells of the developing embryo. However, when you remember that the formation of the superior and lateral tubercles of the face is completed by the twenty-eighth day after impregnation, that at the end of the fortieth day they have coalesced, forming the anterior part of the roof of the mouth, and that at the end of the seventieth day the entire roof of the mouth is completed, this will help you in reassuring the woman as to the probable effect of such a maternal impression. Should such a violent impression take place prior to the fortieth day a cleft of the palate is possible. After the seventieth day of fecundation there is no danger. An assurance of this character will bring an amount of mental relief to the mother that cannot be imagined. You, as dental practitioners, know that during the period of pregnancy the teeth become much softer, much more liable to caries, and from your knowledge of physiology you are aware that during this period there is a very remarkable diversion of the lime salt from the mother, hence the importance of a most generous and abundant diet during the entire period of pregnancy. Also, it was shown by experiments conducted in the zoölogical gardens of London, Dublin, and Philadelphia that the feeding of lionesses, tigresses, and other carnivorous animals for several years upon flesh without bone—therefore food deficient in lime salts—resulted in litter after litter of cubs with cleft palate and other developmental defects. In view of the foregoing, the importance of a full, abundant, and generous line of diet for the pregnant woman is imperative.

If this paper will persuade the dental practitioner to make a close observation of all the structures of the mouth under all circumstances, I shall be very glad, because the practice of your profession is becoming more and more exacting, and —especially at this time of universal agitation—an ultra-critical spirit has been aroused.

People have been stirred by the revelations of the investigations in national, state, corporate and financial affairs, and are disposed today to be hypercritical and hyper-exacting concerning even their personal interests and conditions; hence the disposition among many people to criticize *everything*—which includes the doctor's prescription and the dentist's work. It is for the protection of the dentist that I would urge extraordinary care in the examination of every case presenting itself for treatment. Some of these cases, dissatisfied perhaps with dental work by others, purposely conceal the fact that they have been elsewhere under treatment, and aim to have some expression of opinion upon which to found future legal proceedings.

It seems to me to be the duty of every ethical practitioner to make a most accurate preliminary examination of every mouth, and record the condition at the time of the examination. Thereby he will protect himself against litigation, and incidentally protect a fellow practitioner against whom statements and charges may be made for the sinister purpose of extorting blackmail and easy money.

REMOVABLE BACKINGS IN CROWN AND BRIDGE WORK: ANOTHER METHOD.

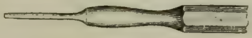
By SAMUEL H. MCAFEE, D.D.S., New Orleans, La.

THE removable backing or detachable facing principle has many points of excellence which are at once recognized and appreciated by the experienced bridge-worker. These points have been expatiated upon at length and are already familiar to those interested in the subject.

Several methods for accomplishing the same general result have been advanced. In the one here briefly described small platinum tubes constitute the basic principle. They are used so as to preserve in proper size and alignment small holes through the body of the crown (or dummy) for the accommodation of the pins of the facing—the latter being cemented to place in the finished piece.

Fig. 1 is a mandrel, made of an old instrument, for forming the tubes.

FIG. 1



The tubes should be made of about No. 38-gage platinum, and should be about one-fourth inch long, and slightly larger in caliber than the pins of the facing to be used.

Fig. 2 shows the tube as formed around the mandrel, ready to be joined with platinum solder or pure gold—preferably the former, with the oxyhydrogen blowpipe.

FIG. 2.

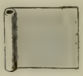
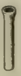


FIG. 3.



After the joint is soldered, the surplus is cut off and the joint filed rather smooth. The tube is now pushed down and twisted against the tapering base of the mandrel to give one end a slight flare. (Fig. 3.)

The facing is ground to proper shape as usual. The backing, preferably of about No. 38-gage platinum, is now roughly adapted in the usual way, and holes are punched through it large enough for the tubes to fit into them snugly.

A tube is placed on each pin of the facing and the backing is carried down over them. The flare on the end of the tubes causes them to tighten in the backing. Backing and tubes are now removed and joined with a minute quantity of solder—preferably platinum solder. The small surplus of tubes on the facing side having been ground off, the backing is returned and carefully burnished and trimmed. A little manipulation may be necessary to make the backing go on and off the facing easily. Twisting a smooth, tapered instrument in the facing end of the tubes will usually accomplish this.

Hold the backing by one of the tubes with the soldering tweezers, and flow pure gold over the lingual side to reinforce it. The incisal edge of the backing may be left a trifle long to insure sufficient thickness of gold at the incisal or occlusal edge of the facing—the surplus being ground off subsequently.

If the operation be carefully done, no gold will run into the tubes or on the facing side of the backing, and the latter will go on and off the facing freely.

Fig. 4 shows a reinforced backing. The tubes are purposely left long so that their ends stand up above the level of the solder in the final soldering.

The gold occlusal surfaces of posterior crowns or dummies are formed in any of the ordinary ways, and the parts are assembled on the cast with wax. Care must be taken that no wax flows into the tubes or between the backing and facing, otherwise it will be difficult to remove the facings prior to the final investment.

I prefer to make the articulating cast of plaster, and to transfer the assembled piece from this cast to a final investment composed of two parts "Sump" or "Champion" compound and one part sand. Removal of even extensive pieces from the plaster cast may be safely accomplished if the abutment pieces are loosened on the cast prior to final assembling. This is facilitated by flowing a little wax in the copings and on the posts prior to filling the impression.

FIG. 4.

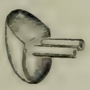


FIG. 5.

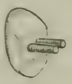
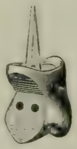


FIG. 6.



When the parts are all waxed for investment, lay a piece of broken match along the lingual aspect and join it rigidly with Crown sticky-wax—stiffening the piece so that it may be safely removed and invested. An investment so made is less liable to crack or warp in the fire.

Just prior to the final investment the facings are of course removed, and the facing side of the backings is coated with chalk-alcohol paste; this is worked into the tubes to prevent the solder from flowing in undesirable places.

If platinum, platinum solder, and pure gold are used in the initial steps, the body of the piece may be safely made with 22-k. solder. There being no oxidation of the platinum parts and no danger of melting them, a minimum of borax may be used, and sufficient heat applied to thoroughly fuse the high-grade solder and insure its flowing into the interstices, leaving few, if any, borax pits.

After the final soldering is completed, the piece may be cooled off at once by dropping it in water. The surplus tube-ends are now ground off and the piece roughly finished and pickled. The inside of the tubes (now simply holes) should be roughened with a bur. The facings should be cleansed, their lingual sides etched with hydrofluoric acid and again cleansed, a brush being used to remove the film of dissolved porcelain. The pins may be "nicked," or threaded with a Bryant bridge-repair screw-cutter No. 1 (see Fig. 5), and the facings carefully cemented to place. After the cement has thoroughly set, the lingual openings of the tubes or holes are closed with cohesive gold, and the piece is given its final finish.

Fig. 6 shows a complete crown ready for the cementing of the facing.

In cases where the gold backing must necessarily be thin, the Shriver method (S. S. W. catalog "Crown and Bridge Work") may be used to advantage, though in nearly every instance there will be sufficient depth of the holes to insure strong anchorage if the precaution be taken in the beginning to incline the pins so that they will pass through what will subsequently be the thickest portion of the body of the crown or dummy.

While 22-k. gold plate, 22-k., 20-k., and 18-k. solder, and the ordinary blowpipe may be used in this method, much finer work can be done with platinum, platinum solder, pure gold, and 22-k. solder, using the oxyhydrogen blowpipe. I consider it indispensable in high-class crown and bridge work. The beauty and fineness of a crown or bridge in which nothing below 22-k. solder is used, and the ease with which the work may be done with the oxyhydrogen blowpipe makes its use well worth while.

No claim is made for originality of the general principles involved in this method, the tube feature being probably the only element of novelty in it.

CLEFT PALATE: ITS ORIGIN, EFFECT, AND TREATMENT.

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I DO not appear before you tonight to exploit any new theories nor to claim any originality in the appliances to which later I shall call your attention. Some years ago Dr. Norman W. Kingsley covered this subject in a number of papers to which later developments along this line can add very little. But a new generation of dental practitioners has sprung up, and whereas it was the great privilege of some of the older members to have heard these papers delivered by Dr. Kingsley, I feel that it is not time altogether wasted in presenting this subject once more to the profession.

Cleft palate may be either acquired or congenital. The acquired condition may be either caused by a traumatism or by disease—usually specific. The cause of the congenital condition—or more correctly speaking, the genesis of this condition, as nobody knows the cause—is an arrest in the development of the tissues, not merely a lack of union of the parts. At the close of the tenth week of fetal life the maxillæ and the vault of the mouth are fully formed, and the influences which caused the development in this locality to be arrested must have occurred prior to this time. The extent of the fissure will depend upon the time at which the arrest in the developmental process occurred; hence the earlier the arrest in development occurs the greater the lack of tissue; and *vice versa*. There is some evidence that this condition is sometimes inherited, but most cases have no such history.

The effect of cleft palate is to render speech more or less imperfect, often almost unintelligible—and right here I may add that the size of the fissure does not necessarily denote the amount of imperfection in the speech. I have here a model of a case treated by Dr. Kingsley, in which the cleft is very small, amounting to very little more than a division of the uvula. The speech of this patient was as bad as it could possibly be. Another model shows an enormous double cleft, accompanied by double hare-lip. The speech in this case was no worse than the first. On the other hand Dr. Kingsley says, "I have seen an extensive fissure involving hard and soft palates, a portion of the alveolar process, and the lip (hare-lip), where but that the lip directed attention to the possibility of a palatal cleft, such a deformity would not have been suspected from the speech, except by the most critical ear. For the ordinary purposes of life, and to the average listener, the speech was good. The only admixture was an occasional guttural sound, which does not belong to pure English." I have here the model of the case to which he refers.

In cases of normal development the velum palati is of sufficient length to meet, when elevated and drawn back by the levator palati and tensor palati muscles, a transverse ridge on the posterior wall of the pharynx, made by the contraction of the superior constrictor muscles. In order to articulate perfectly, it is absolutely necessary that this condition should prevail.

Dr. Kingsley, in his work on "Oral Deformities," says that more than three-quarters of the sounds of the articulate language depend upon the integrity of the palate for their perfect enunciation. Also that "Pure vowel sounds can be made only by resonance of the buccal cavity alone, and in its normal integrity. Any escape of sound behind the curtain of the palate will nasalize the vowels. This is the explanation of the peculiar vowels of the French language."

We may see clefts varying greatly in extent, from a mere notch of the uvula to one extending through the soft and hard palates and the alveolar process. This condition is frequently accompanied by hare-lip.

We may have cleft palate with or without hare-lip, or on the other hand we may have hare-lip with or without cleft palate; and we may have a cleft of the alveolar process only. This latter condition, however, occurs very rarely. Dr. Kingsley reports one case of double cleft of the alveolus alone.

In cases where the cleft passes through the alveolar process, it may follow a suture on one side of the median line and so form a single cleft, or it may follow a suture on each side of the median line and so form a double cleft.

There is a general impression among the dental and medical professions that a cleft follows out the suture between the maxillary and premaxillary bones on one or both sides. This is not always true, although it is in a great number of cases.

In embryonic life there are four distinct portions of the intermaxillary bone, each portion carrying a germ of an incisor; these parts all subsequently coalesce and unite with the maxillæ, except upon the median line, where they unite by suture. Any one of these portions may fail to develop, and consequently the fissure may occur between any of the six anterior teeth, as may be seen illustrated in the models which I have here on exhibition. These models were all made from impressions of actual cases for which appliances were made.

The treatment of cleft-palate cases may be either surgical or mechanical. These patients do not apply for relief because of the regurgitation of food in deglutition, or for any other reason except to have something done so that they may improve their articulation. No other function is materially interfered with. Consequently staphylorrhaphy should be performed only in those cases in which the abundance of tissue is sufficient to warrant the belief that when the operation is completed the palate will be of sufficient length to reach, by muscular effort, the posterior wall of the pharynx when so desired.

Dr. Kingsley says that the reason why staphylorrhaphy is so generally a failure —even when it is a surgical success—is because the newly formed septum is rigid, tense, and deficient in length. In the large majority of cases it cannot by any possibility be brought into firm contact with the pharyngeal wall, and imperfect speech will necessarily always follow this defect. To the credit of surgery be it said, that it has done probably all it can under the circumstances, and the only surgical hope of the future seems to lie in the direction of making the operation at a very early period of life, with the expectation that as the organs develop in tissue, function, and activity, the defect will be overcome. Dr. Brophy of Chicago, as you all know, has performed this operation on very young infants a great many times. He states, I believe, that to obtain the best possible results these children must be operated upon during the first few days, or at least the first few weeks after birth. Cases operated upon subsequent to this time will derive benefit, other things being equal, proportionate to the time at which the operation is made. If performed after the child is a year or so old it may prove to be a success surgically, but physiologically it will, in all probability, be a failure.

Dr. Kingsley reports one case in his practice (and he has seen a great many of these patients) in which he felt justified in advising an operation. The patient was accordingly operated upon, and after seven years, during which time the child was under constant training in voice culture and articulation, the case proved to be a failure. An appliance was made, with the help of which the child ultimately acquired distinct and perfect articulation. This child when operated upon was between two and three years old.

The mechanical treatment of cleft palate may be divided into two classes, those which are treated by means of obturators, and those for which artificial vela are required. The artificial velum is a soft flexible valve, and readily adjusts itself to any movements of the muscles, while the obturator is hard and unyielding.

Acquired cases of cleft palate have from remote antiquity been treated by the aid of obturators of various kinds. The first to make and describe an appliance to close an opening in the palate was Ambroise Paré in 1541. He made a disk of gold a little larger than the opening in the palate, provided with a wire or forked spring so arranged as to hold a small sponge. This sponge, when inserted into the opening, absorbed the secretions, and swelling slightly, held the appliance in place. But there is a physiological law which can never be disregarded, *i.e.* whenever there is continued pressure on a part, absorption will surely follow. This is well illustrated in orthodontic operations.

The case for which Paré made his appliance was one of perforation of the hard palate due to specific disease, and when the appliance was inserted, speech was restored instantly, but the continued use of the sponge tended to the enlargement of the opening. I may here say that any kind of an obturator or plug will restore the speech in acquired cases, but it will not do so in congenital cases unless the patient has previously perfected his speech with some other appliance.

The next step was naturally to do away with the sponge, and the next appliance which he made somewhat resembled an enlarged collar-button, with the smaller disk inserted into the nasal cavity.

I will not attempt to trace the development of the obturator. We find the names of Dr. Warren Rowell of New York, Dr. S. P. Hullihen, and Professor Buckingham of Philadelphia closely associated with improvements along this line.

It was not until 1867 that Dr. William Suersen made the first obturator for congenital cases upon correct principles.

The first velum was made by Delabarre in 1820. This was for an acquired case of syphilitic origin. Snell in 1823 made the first velum for a congenital case. Dr. Stearns in 1841 or 1842 made the first velum in which the palatal muscles were used to assist in closing the opening between the pharyngeal and nasal cavities. It was a most complicated affair, however, and it remained for Dr. Kingsley to invent a palate, simpler in construction and of more universal application.

Dr. C. S. Case of Chicago has recently brought out an obturator for which great claims are made. I have never seen one made or applied, consequently can venture no opinion as to its merits.

With the Kingsley velum, patients can acquire such perfection of speech as to leave nothing that could possibly attract attention to the deformity. While this happy state of affairs is difficult to obtain, with time, intelligence, and determination on the part of the patient it can be done, and has been done in hundreds of cases.

It is a question of judgment as to which kind of appliance should be made for a given case. In 1903 I made an artificial velum for a patient. It was constructed and adjusted perfectly, yet the patient when last I saw her had improved very little—due almost entirely to the fact that she did not possess sufficient intelligence. I should have made an obturator for her, as she would probably have derived as much benefit from that as from a velum, and it would have been more permanent.

I have several other patients for whom I have made vela, and while all have been considerably benefited, in some of them the improvement has been remarkable.

In conclusion I will quote from Dr. Kingsley, who says that—

"(1) In most cases of congenital defects the patients will acquire correct articulation more easily and more certainly with an elastic velum, scientifically adjusted, than with any other form of appliance, because it more nearly resembles the action of the normal palate and will more readily fulfill its function.

"(2) That in a great majority of cases of a like defect a patient will never acquire distinct articulation with an obturator.

"(3) That where a patient afflicted with a congenital absence of the palate has overcome the difficulty by wearing an artificial velum until clear and distinct articulation has been acquired, he may exchange the velum for an obturator, and continue to articulate properly.

"(4) That of all obturators to supply deficiencies of the soft palate and induce correct articulation, the one introduced by Suersen contains the truest principles and is best adapted to the purpose."

EMPYEMA OF THE MAXILLARY SINUS.

By A. R. SOLENBERGER, M.D., Colorado Springs, Colo.

(Read before the Colorado Springs Dental Society, January 14, 1906.)

IT gives me great pleasure to appear before this society of dentists for the study of a subject in which our common interests are so largely represented. Perhaps no two special lines of the healing art meet so closely in practice; indeed, so frequently do they "telescope" that it is impossible for us to do scientific work without confederation of dental and rhinological knowledge. By scientific work, I more particularly mean prophylactic work. I do not mean that preventive work is the *only* scientific work, but that it is the most rational; it should constitute the first intent and moral in our practice. We might very profitably devote the entire evening to the study of prophylaxis in acute disease of the maxillary antrum, that is, to the consideration of the conditions which predispose to disease of that sinus. But at this time we will allude to these conditions but briefly.

Knowing, as we do now, what a stubborn proposition we have to deal with when antral disease becomes chronic, our duty in prophylaxis in the acute condition should be taken most seriously. Here it is that all our resources should be marshalled to prevent its transmission into chronic form. It is, therefore, of the first importance to know all the pathological forces which come into play in the particular case which comes to our hand. But it is not my purpose to study in detail every etiological force which may produce disease of the maxillary sinus. These are usually conventionally given in special text-books. We will more particularly study technique or method by which the causal forces may be recognized as an aid to diagnosis.

In the diagnosis we note, first, that in the acute cases the cause is more frequently a single one, and is correspondingly more easily found, but is usually more obscure, because the naked-eye signs usually present in the chronic cases form a more distinct outline.

However, in the chronic condition, the primary cause is often completely obliterated; indeed, in the evolution of the highly chronic cases, a series of subcausal factors intervene which, together with the initial cause, constitute a pathological circle, some of the important segments of which are diseased alveoli, chronic, simple, or suppurative nasal catarrh ozena, chronic pharyngitis, and even pulmonary or gastric catarrh; and sooner or later a much larger circle is described, in which the nervous system and the general constitution are included.

Now, my experience leads me to believe that the dentist and the rhinologist stand practically in coequal positions at the open door of disease of the maxillary sinus. We know at least that some cases are purely dental and some entirely rhinological in origin, and remain so throughout the entire course; but many, especially the chronic type, have for their pathological base both dental and nasal lesions; so it transpires in many cases that no kind of treatment of the antrum directed to the teeth alone will avail, and inversely, no kind of nasal treatment of the sinusitis will succeed against a diseased tooth or necrotic alveolus.

The fact that antral disease originating in the nose or antral empyema itself may cause disease of the teeth would perhaps be very difficult to demonstrate. Dentists would be more likely to possess data showing whether the disease process does take this course. It would seem that since this disintegrating process in the sinus is particularly accentuated on its floor, there would likely occur an affection of the teeth in those cases where the alveoli protrude prominently into the antrum, and still more likely in the case where the teeth are already unsound. Anyhow, in the presence of these particular disease conditions we would expect the antral affection to extend to the alveoli by progressive infection, the pathway for the germs being the usual one, viz, the foul secretions bathing the antral floor, the diseased cellular floor, the unsound tooth or alveolus. The infection of the teeth, I am sure, may also be hematogenous, that is, through the blood and lymph vessels.

ACUTE SINUSITIS.

Etiological forces. Acute sinusitis should perhaps interest us more on this occasion than the chronic form. In some cases at this stage the diagnosis is simple. There is more often only a single causal force, but this single cause as noted is usually more obscure than in the more advanced condition. In the acute, pain is a more prominent sign. In the chronic, the naked eye is helped by the conformations and secretions in the nasal passages.

We should watch for the earliest signs and causal forces, and must recognize that at the least the causal forces are at work before any gross lesion or objective sign appears.

Predisposing causes. On the dental side, I would note not only diseased or devitalized teeth, but also discolored ones. I am convinced that the mere presence of a carious tooth near the sinus—without its roots protruding into it—may set up repeated attacks of sinusitis. Capped first molars should always be viewed with suspicion. It should be remembered, also, that any tooth from the third molar to the central incisor is in position to cause sinusitis.

I have no doubt, also, that in the various deformities of the maxillary bone we have a prolific predisposing causal force of sinusitis. We have only to study the evolution of the deformative process to see the *modus operandi.* We will see how, on the dental side, the narrowing of the palatal arch and consequent crowding of the teeth may cause pressure neuritis and tissue-pressure inflammation, or at least create an irregular blood supply, interfering with the nutrition of the sinus.

The perniciousness of these deformities, however, is more clearly seen on the nasal side. A high palatal arch means often a deviated septum, or spurs, or exostoses on the septum and hypertrophy of the turbinates, or any condition in the nose which interferes with the free passage of air and ventilation of the sinus.

We might mention many predisposing causes more remote but no less potent, originating in the nervous and vascular systems, especially from the latter—as for instance, large quantities of waste, irritating materials, eliminated from the blood and lymph channels through the mucous membrane of the nose.

Exciting causes. We must recognize that the borderland between the predisposing and exciting causes is often very narrow indeed.

These predisposing conditions in the presence of internal (vascular) and external (atmospheric) irritants, invariably become exciting forces. A discolored tooth, or a perverted nasal secretion may be suddenly transformed into an exciting force; indeed, this mode of infection is no doubt the most frequent initial causal force in the evolution of disease of the sinus. Thus a very slight irregularity in structure or function of the nasal fossæ or teeth should not be beneath our careful attention.

From the dental side, I make note only of such exciting causes of sinusitis as have come to my notice. The injury resulting to the alveolus from the extraction of teeth must be mentioned. Indeed, if to these traumatic cases we add those in which the disease of the tooth before its extraction has already extended to its alveolus, and all cases of extraction which have received little or no after-treatment, we shall find a very fruitful excitation, which through infection may become a direct cause. I presume that dentists could recount cases of sinusitis springing directly from the imprisonment of foul and infectious material in the operations of filling and capping the teeth. Cases with a history of this kind not infrequently come into the hands of the rhinologist.

If we now turn to the nasal side of the antrum, we shall find that the exciting etiological forces are more numerous as the field is wider. To see the play of the pathologic forces from this direction, we need perhaps to review the anatomico-physiological picture. Briefly, it is this: The maxillary antrum is a part of the respiratory tract; it is a recess of that tract; it is an *open* air-cavity. Its normal life demands air. Diminish or cut off its supply of air, and you deprive it of its atmospheric food. A poorly ventilated sinus from orificial obstruction is a poorly nourished sinus, and a vacuitous sinus from orificial stenosis spells a *diseased* sinus—for into a vacuitous cavity lined with serous membrane accustomed to normal atmospheric pressure, there soon pours serous fluid. In the obstructed sinus duct you have the causal base for catarrhal inflammations, and in the stenosed duct you have the causal base for empyema.

We have already mentioned among the predisposing causes some of the conditions which obstruct the antral orifice. To hypertrophy and septal deformities we must add nasal polypi and the ordinary catarrhal secretions, as well as ozena, the crusts of which especially block the antral duct. Sooner or later, however, these mere obstructions become more than a dual pathological force—they not only interfere with the normal air-supply of the sinus, but by their interference with the ventilation and drainage of the nasal passage itself and the other nasal accessory cavities, they also cause catarrhal processes in the contiguous cavities above.

We may well ask here, What is the significance of inflammation of the cavities bordering upon the maxillary sinus? Let us examine their comparative and relative anatomy.

The opening of the antrum is situated underneath the anterior end of the middle turbinate; but in this covert area are also the openings of the anterior ethmoidal cells and those of the frontal sinuses. A ten-cent piece would cover all three of the orifices. Now, in the location of the antral opening we have what in anatomical structure may be called a paradox—a seemingly poor adaptation of efficient means to an end; the location of the hiatus semilunaris affords not only a very poor antral drainage, but the hiatus being funnel-shaped—infundibulum (Zuckerkandl)—makes an excellent hopper for the dumpings of secretions from the upper sinuses. Next in frequency to maxillary sinusitis comes ethmoidal sinusitis. And ethmoiditis, especially when advanced to polypoid degeneration of the middle turbinate—which in itself acts as an obstructive to the antral duct—also on account of the perverted and often infectious secretions discharged directly into the funnel-opening of the antral duct, must of necessity create an antral inflammation. But advanced ethmoiditis is also the most potent cause of frontal sinusitis; so we frequently have the catarrhal and infectious products of *both* the upper cavities pouring into the antrum. We have already a large and vicious pathological circle, and we can see how largely the maxillary antrum is in the grip and under a multiple fire of disease-producing forces.

We have yet, however, to consider the exciting forces which are really universal—the infectious forces which act through the blood and through the atmosphere. Many of these set up inflammation in comparatively healthy nasal tissues, but in the diseased conditions they find a soil in every way fitted for their pathogenesis. Perhaps among the infectious forces the influenza germ heads the list of those which act from without, and among the non-infectious, but hardly less irritating ones, are uric acid and ammonium sulfocyanid products acting from within.

Without enlarging the pathological picture, we can readily see how the maxillary sinus comes to be far more frequently affected than any other in the group of accessory sinuses.

SIGNS OF ANTRAL DISEASE.

In this study of the causal forces, we have already forecast the signs of antral disease. We know where to look for them; we see their outcroppings. Pathology, as well as our experience, teaches us that there are very few cases, even in the acute stage, where any one diagnostic means enables us to fix the diagnosis. Indeed, many tests must be used, and in some all tests fail, except such as are more or less surgical.

In any acute case of pain or inflammation in or around the antral field, it would perhaps be first in order to see whether any of the causal forces above named have been, or are, at work. Here is the time for honest or prophylactic work.

On the dental side: Is there any disease force at work on the teeth? Is the pain or inflammation due to work done on the teeth? If the teeth and alveoli are sound, or the ground for condemnation is small, rather than sacrifice a tooth simply suspected the nasal side should be at once examined. I need hardly say that if a tooth is known to be the cause (and this can frequently be determined) the cure should begin there, and in certain cases the tooth should be sacrificed to make a vent for the imprisoned contents of the sinus; but in all cases of doubt I would give the teeth the benefit of the very wholesome rule, viz, make a tentative attempt to give relief through the nose. Here is where the dentist should give way to the rhinologist, at least temporarily.

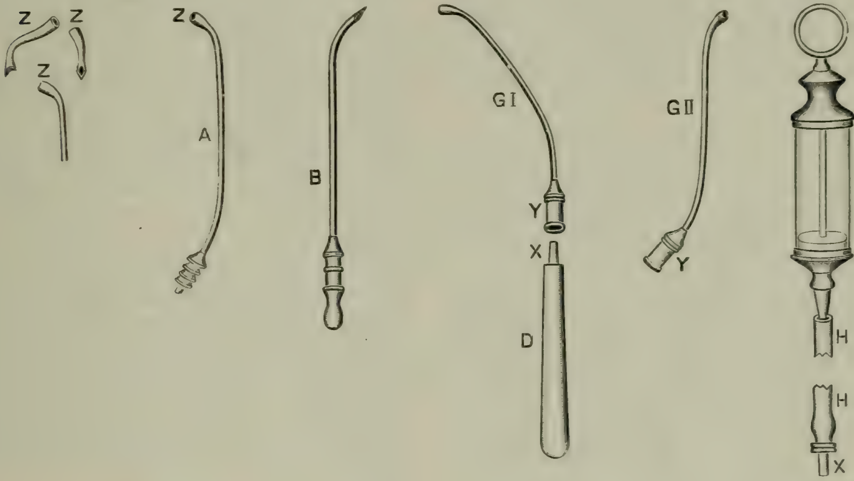
If gross nasal lesions are found—in the acute cases—in the nose, some burden of blame is already taken from the teeth; but whether these be found or not, the swelling in the nose should be reduced and an attempt should be made to pass the cannula into the antrum through the natural opening, both for the removal of any possible contents and for its ventilation. This can be done in about fifty per cent. (Pierce) of the cases where conditions in the nose are normal.

Sometimes one succeeds better with Freeman's hard rubber cannulæ, which are more slender and pliable, adapting themselves to a duct which is actually a *sinuous*. Failing, however, to gain access by these natural openings, there should be no hesitation to aspirate the antrum through the thin osseous or membranous part of the nasal wall. If one wishes to aspirate simply for diagnostic purposes, the conventional syringe with a small needle is preferable, but I usually prefer in many cases to use at once a larger needle (see illustration, B), through which the antrum can be washed out. Frequently, by shrinking the swollen middle turbinal with cocain and adrenalin and employing a variety of cannulæ, many more antrums can be entered via the natural opening.

I would call attention here to a few I have devised which have served me well, especially those (see illustration, A, z z z z) with an initial upward and final downward curve, which enables one to enter a hiatus situated some distance underneath the overhanging turbinal; also those cannulæ (see D, G I, G II) which combine the probe feature. These are well balanced, the handle being of aluminum. The probe cannulæ having found the opening, the handle is easily withdrawn and replaced by the coupling (H, X) for the immediate use of hydrogen dioxid, etc. If necessary, this artificial opening can be enlarged for subsequent treatment; the condition of the antrum should determine this. Of course the kind of treatment that can be given through such an opening is only adequate in purely acute and uncomplicated cases.

Transillumination should always be a diagnostic test before aspiration; for even in acute cases it may tell something.

Aspiration, however, is a real prophylactic precedure, whether serum or pus be found or not. It controls the inflammatory process; and supplies air to the antrum; the treatment may now be expectant. Meantime, a filling or a cap may be removed and aspiration and irrigation may be repeated.



Later after the heat of the disease has passed, any and all causal lesions should be removed. Most of these cases get well by these tentative measures. Indeed, uncomplicated cases nearly always make for self recovery. This is most fortunate, when we know that in almost every case of severe acute rhinitis the antrum is involved. There are cases, though, in which the sinusitis occurs prior to rhinitis.

We know, however, that the acute cases in which suppuration takes place are usually complicated, by some lesion in the teeth or nose. This must be sought out, and the above treatment must be accentuated surgically to such a degree as to secure efficient cleansing and drainage. If the causal lesion is in the alveolus and teeth, drainage through the tooth-socket is certainly the most logical procedure. Acute, and even some subacute cases, will be cured by this means; *note the condition,* however: If the first and only lesion has been in the tooth-socket, and the inflammatory process is in the acute or perhaps subacute stage.

A certain dentist stated before a meeting of rhinologists that all his cases of antral empyema recovered by treatment through the alveoli. It transpired afterward, from his report, that his cases were all acute, and from what we know now he must have had the good fortune to treat only cases with no nasal or only slight nasal lesions.

CHRONIC EMPYEMA.

It is of the first importance to all concerned to make certain that there is not lurking in the case in hand a chronic element; for many of these acute suppurative cases have a chronic base. It is sometimes impossible to detect it, but even when it is suspected, tentative corrective measures should be begun. Drainage may be established either by the alveolus or by the nasal wall; discriminating knowledge and fine judgment are at the highest premium now. One should not draw upon the patient's purse and time too long with the expectant treatment. If, in one or two weeks of effective drainage and cleansing, the suppurative process does not considerably lessen, showing that the causal element of chronicity has not been reached, the openings should be made larger, for the purpose both of diagnosis and further treatment. Now the degree of chronicity should be positively determined, for this will largely determine the degree, as it were, in which surgery shall enter. We now no longer rely on the nature of the secretions; we must, through efficient openings, examine every part of the antral wall; the educated touch must be at the end of the probe to test the condition of the lining, to search for necrotic areas.

In not a few cases, the naked-eye appearances of the teeth, and especially of the nose, and the history alone, will indicate that degree of chronicity over which only the radical surgical treatment can prevail.

The operative measure must now be aggressive and radical along these same lines, and in proportion to the degree of chronicity prevailing. I have time only to outline the surgical measures required in the highly chronic condition. Assume that the acute exacerbation has passed; that an opening may exist per alveolus or per nasal wall, or both; that any neuroses that may have existed in the antrum around the alveolus have been removed; that any lesion in the nose which may have been a direct or contributory cause has also been corrected; and that notwithstanding this line of treatment, a part of the sinus membrane shows a degree of degeneracy which requires its removal, as well as of any diseased bone in the cavity, especially on the floor and out-of-the-way recesses. Polypoid and other hypertrophied tissues on the antral side of the nasal wall around the antral orifice may also be found, all of which require a careful thoroughness of curettement not possible except through a large opening and under good inspection light.

I now repeat, this can be done only through a large opening through the canine fossa. No adequate curettement can be made through the alveolus or nasal fossa in this class of cases. The opening is enlarged in a downward direction toward the floor and toward the nasal side, for there necrotic tissue is most frequently found. Indeed, on the inner side of the nasal wall, the hypertrophied pus-producing tissue is often so tough that sufficient space should be provided for use of scissors or punches, and the floor must be so exposed that a careful inspection may be made of the alveolar prominences and for the removal of any necrotic tissue. Indeed, the opening must be enlarged progressively, so that every recess of the antrum may be curetted by sight.

The next point to be determined is the avenue through which the after-treatment is to be carried on. This is sometimes difficult to decide. In a general way, it may be said that one must be guided by the conditions prevailing in each case.

If the bone necrosis is extensive and there is any considerable doubt of all disorganized tissue having been entirely removed, it is better to treat the case through an opening in the canine fossa for a time, so that the healing process in the new membrane may be easily examined and any exuberance of tissue pressed down.

In most instances, however, we can be certain of the efficiency of curettement, so that in the case where an alveolar opening is present (having been etiologically required) the canine opening may be at once closed or allowed to close early, and the after-treatment carried on through this vent. The trend of modern rhinological surgery in these cases, however, has been to remove a part —or better, the whole—of the nasal side of the antral wall after the curettement, making this the sole and permanent vent. This has been very satisfactory in my hands and in those of others. I believe it will be the course most frequently followed in the future. In cases where there is no alveolar opening (none required), it should always be the treatment given, and *always* in the very chronic cases though there be an alveolar opening; for if the antrum heals, the nasal opening does no harm, and if, perchance, a normal healing does not occur —and these are the cases where a rather large percentage do not entirely heal, or have a tendency to relapse into a catarrhal state—then it is more desirable to have an opening into the nose than into the mouth. It should also be noted here that the antral healing progresses more satisfactorily by making vents and conducting the treatment by nature's avenues than through the alveolus.

In most cases where the larger part of the nasal wall is removed and curettement is thorough, we find that the antrum will very largely fill up with firm fibroid tissue, so that it is a shallow sulcus in the side of the nasal fossa, and any secretion that gathers there can be readily dislodged by ordinary blowing of the nose.

Should, however, the antrum not fill up or remain catarrhal, the patient can cleanse it by irrigation through the nasal vent quite as well as through the alveolus. The illustration (F, H, H, X) shows the cannula and syringe which the patient uses to irrigate the antrum during the time of healing, if such irrigation is needed during or after the physician's treatment. This same instrument can be used by the patient at any subsequent time should the cavity need cleansing.

It is found that much of the after-treatment adopted has been, and still is, detrimental to the healing. We do not now pack the antrum except for a few days, or at the most two weeks, and then very lightly; nor are any but neutral menstruums used for cleansing; even hydrogen dioxid being used very sparingly and in the form of swabs only. The wounded antrum must be cleansed with as little disturbance of the delicate granulation tissue as possible.

If it is the object to encourage obliteration of the sinus, growth of firm granular fibroid tissue is to be encouraged. Occasionally, as in the less chronic cases, one needs to press down, and occasionally destroy, too exuberant points of granulation.

If time permitted I would like to follow out the larger pathological circle of which the diseased maxillary antrum is an important segment—viz, its causal relation to diseases of the respiratory tract and the stomach; and I regret much that time will not permit me to consider the question of obliteration of the sinus. When is this form of procedure indicated? It is my purpose to try to answer this in a future paper.

METALLIC SHELL INLAYS.

By T. C. TRIGGER, L.D.S., D.D.S., St. Thomas, Ont., Canada.

(Clinic at the National Dental Association meeting at Buffalo, July 25, 1905.)

GOLD inlays have been greatly used in very large cavities in bicuspids and molars, the walls of which are too frail to support ordinary gold fillings, although they are applicable to almost any cavity, except very shallow ones which will not permit of sufficient anchorage. They have been widely used in dental practice, and are considered, beyond doubt, one of the greatest factors in preserving tooth-structure. Their insertion prevents, to a great extent, the vast destruction of the enamel necessary when gold crowns are used, and the recurrence of decay in large cavities filled with amalgam.

In preparing a cavity for an inlay there are several requisites. (1) The cavity should be thoroughly prepared; (2) The cavity must possess such depth as will admit of good anchorage. (3) The matrix must be easily adapted to the margin of the cavity. (4) Thorough access must be had for its insertion. (5) There must be good retention. We use the term shell inlay for the reason that when the inlay is inverted it resembles an ordinary shell.

First cleanse the cavity of all decay, then proceed to trim the edges. In cutting the margins remove any overhanging portions, in order to secure throughout a uniform line. Angles must be cut away and converted into curves, and straight lines must not terminate too abruptly in short curvatures. Cut the edges straight and avoid beveling.

In describing the making of a shell inlay, I shall take a large cavity involving the mesio-occlusal surface of a molar.

After the edges have been thoroughly prepared (Fig. 1), make a cement core for the adaptation of the matrix. Fellowship cement is preferred, as it can be adapted without any difficulty. After it has been thoroughly mixed to the consistence of stiff paste, apply it to the base of the cavity, filling up the latter nearly to the margins and across its entire floor. In this way a fairly well constructed core will be obtained. In addition, with carving instruments the core can be so cut that a ledge will be made of a few lines in width between the core and the margin of the cavity. Fig. 2 shows the core in position ready for the swaging of the matrix. The use of an intervening substance of this kind will prevent the unnecessary extension of the matrix to the base of the cavity, at the same time minimizing the quantity of gold to be used for the contouring. It therefore follows that the greater the cement area is, the greater will be the anchorage of the inlay.

Fig. 1.

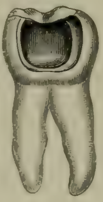
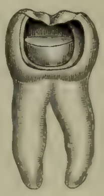


Fig. 2.



Platinum and gold are the two metals used for making the matrices. The former is used more frequently because of its high fusing-point, while the latter, owing to its great malleability, ductility, and comparatively high fusing-point, is also available for the making, especially of gold inlays. The matrix gold, 22-k. fine, should be approximately of 40 gage, but to be more accurate the micrometer may be used, in order to obtain the absolutely accurate gage required. For deep cavities involving large surfaces thicker gold should be used, namely, 0.003 gage, and for shallow ones 0.002 gage. Pass the metal through the rolling mill, always in the same direction, as better results can be had by doing so, this procedure preventing wrinkling and producing a more uniform surface. Cut the gold in convenient sizes, say two inches long by one-half inch in width. Thoroughly anneal the gold before use.

It may be stated here that pure gold possesses a remarkable property that causes cement to adhere to it in a most tenacious manner.

In order to obtain an exact impression of the cavity so prepared, take a small piece of impression compound and force it into position, trim it to the edges of the cavity, and after it cools sufficiently, remove it gently. From this run a cast and from the latter obtain a die. (Fig. 3.)

FIG. 3.

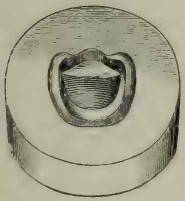
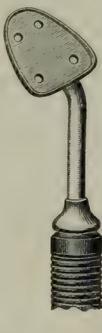


FIG. 4.



Apply upon the die thus obtained a piece of gold of sufficient size, and adjust it to position by means of a piece of rubber.

The compound may be conveyed to the cavity on special cavity trays, of which I have constructed a set to meet the requirements in taking a good impression of any cavity. (Fig. 4.) These trays are sufficiently thin to pass between the teeth, and also quite rigid, so that by placing a small piece of gold on the impression contained in the tray, sufficient force can be applied by means of a small piece of rubber to press the gold with the fingers, in order to approximately accomplish the required result.

Trim the matrix approximately before re-swaging it in the cavity. This is accomplished by means of variously shaped rubbers, consisting of rings, cones, blocks, and with a special set of gold-matrix instruments of convenient forms which I have designed, and which facilitate an easier and more accurate application of the matrix to the cavity. In using these instruments, care should be taken not to burnish the gold at first, but to apply the instruments only with pressure, as burnishing will cause the gold to become rigid and more difficult to adapt and retain in the cavity.

Frequently the matrix can be pressed and burnished in the cavity as described, without the necessity of previously obtaining a die. The matrix should extend a few lines in width over the whole edges of the cavity.

It is advisable in large compound cavities in molars, involving the buccal and morsal surfaces, to make the matrix in two pieces. This will prevent the buckling of the gold and facilitate a correct adaptation to the cavity. When one has satisfied himself that the matrix has been correctly adapted, remove it gently by teasing it out of the cavity with a fine-pointed instrument.

The next procedure is to take a stick of the compound and after softening one end press it gently into the external surface of the matrix. (Fig. 5.) Heat the compound over a Bunsen flame. Care must be observed in doing this, as any undue pressure may change the form of the matrix. The latter being imbedded in the compound, drill holes for the insertion of the pins. The pins should have well-formed heads (Fig. 6), and their length must be determined by the depth of the cavity. Fig. 7 shows a completed inlay for a mesio-occlusal cavity in a molar (Fig. 8).

In teeth with living pulps where the cavities are of limited depth (Fig. 9), insufficient for any extended anchorage, countersunk holes should be made. (Fig. 10.) The countersunk holes are prepared by inserting graphite points into the plain holes. (Fig. 11.) They should be made to penetrate beyond the matrix, and after the filling-in process has been accomplished they are removed, thus leaving holes which, becoming filled with the retentive material, will afford sufficient anchorage for the inlay.

FIG. 5.

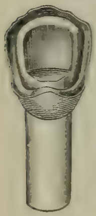


FIG. 6.

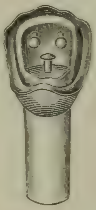


FIG. 7.

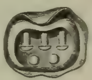
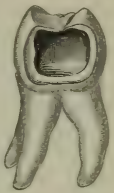


FIG. 8.



At this stage, if the operator should find it necessary, he could further increase the retention of the inlay by using both pins and countersunk depressions, or by using a small tube sufficiently long to obtain a strong anchorage at the base of the cavity, extending it as high as the surface of the core. To secure this in position, it would be well to solder at the lower end a small plate of metal, as will best suit the extent of the cavity. This tube attachment (Fig. 12) is cemented permanently in an upright position, so that the wire anchorage, which is attached to the matrix, will accurately pass within the already cemented post in the core.

FIG. 9.

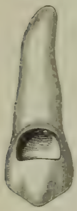


FIG. 10.

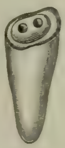
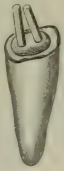


FIG. 11.



The hollow post which is fastened in the tooth should extend slightly beyond the core, so that when the matrix is compressed over it, it will produce a slight indentation which will indicate where to penetrate the matrix for the anchorage post, which should fit the hollow tube accurately.

To make the contour, cut a piece of 22-k. gold and apply it to the vacant side of the inlay; wax it in position. Finally insert the matrix and all its attachments in plaster (no sand being used) to hold them in place while the filling-in process is accomplished. 20-k. solder should be used for soldering the work throughout, as by this means, when completed, it will have a decidedly rich appearance. (Figs. 13 and 14.)

FIG. 12.

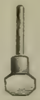


FIG. 13.

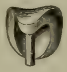
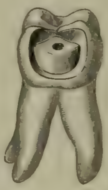


FIG. 14.



In using borax as a flux, do not apply very much at a time. It should be sprinkled on dry, for if it be used wet it may possibly form an incrustation which might prevent the solder from flowing to all the parts of the matrix and its attachments. To cement the inlay in position, select the very best and finest cement obtainable. After giving the cement sufficient time to set, the inlay should be trimmed, polished, and burnished.

In constructing the inlay for the anterior teeth, the method which I follow is very similar to those which have been described; namely, the application of the core to the cavity, the taking of the impression, the construction of the die, and the various attachments necessary, such as pins, posts, loops, and countersunk depressions, when the inlay is cemented and finished in a similar manner. Of course it is well to avoid the use of the gold inlay in these teeth, as the porcelain inlay meets all the requirements, but when it cannot be substituted, the gold inlay can be successfully used.

It may be stated here that it is not intended that the gold inlay should replace the gold filling, but rather that it should supplement it.

FORCES EMPLOYED IN CONDENSING GOLD FOIL IN CAVITIES OF TEETH.

By **H. HERBERT JOHNSON, D.D.S., Macon, Ga.**

(Read before the South Carolina Dental Society, White Stone Springs, July 18, 1905.)

THE heading of this article would imply a liberal and very comprehensive treatment of the subject, but that is not the intention as only the best forms of force from a purely practical standpoint will be considered. From the very nature of the process of filling cavities of decay in teeth, whatever material is used, some kind of force must also be employed in connection with it. Gold foil from its character and consistence requires a greater amount of energy to condense its particles into a solid mass, or into absolute moisture-tight contact with the cavity walls of the tooth, than any other material used for the same purpose. Gold, from the inherent properties possessed by it, is capable of being manufactured into so many different and varying forms or states of softness, plasticity, or friability, that in considering the method of obtaining force for its condensation, these different forms, as well as the nature of the substance against which it is to be placed, must also be taken into account.

For many years after dentistry had assumed the dignity of a profession, what is termed hand pressure was alone employed in condensing the filling materials. During that period, also, only form of gold employed was that known as soft or non-cohesive foil. For this particular kind of gold, this method of condensation was practical and all-sufficient for the then needs and the forms of cavities in which it was packed. But as the importance of saving more broken-down teeth and roots of teeth became impressed upon the minds of the profession and of the people, it became apparent that something more was needed than soft foil and hand pressure. Then came the discovery of the cohesive property of gold as applied to dental operations, and with this discovery it became necessary to adopt a different application of energy for its condensation, for it was very apparent that hand pressure could only be employed successfully in the very beginning of the operation, or for starting the filling.

It then became evident that the force must be something of the character of a striking blow, and that the pieces of gold must be fed in and condensed gradually by adding and packing piece by piece. The nature of cohesive gold and the manner of condensing it made progress very slow in building in a filling, especially with a hand mallet, the only kind then in use. The value of time led the manufacturers to cast about for something which, while possessing the solidity and strength of cohesive foil, might be condensed with more rapidity even with hand force, and this brought into existence the fiber and crystal forms of gold such as crystal mat, moss fiber, and all of that class. Now we have three classes of gold with such different properties that they can best be considered under three separate heads. For condensing these we have the application of two distinct characters of force—the mallet or driving force, and the pressure force as obtained by hand pressure. As to which of these forms of gold and which of these applications of force is the most practical in filling tightly the cavities of teeth in such manner as to get the very best results from the materials in hand, remains yet to be considered.

That the tooth-saving quality of gold depends almost entirely on its close adaptation to cavity surfaces—which adaptation in fact must be so close as to preclude the possibility of moisture or bacteria entering and insinuating themselves between the material and the surface it is intended to protect—is hardly questioned. That some slight therapeutic effect may be exerted by some forms of gold is and always has been a subject open to argument. This being the case, then, it becomes very apparent at once that that form of gold, coupled with the form of force most applicable to it, which can be made to become most closely adapted to the surface walls of the tooth, is the combination which will most successfully combat and prevent the return of the carious process. All forms of gold when repeatedly hammered, burnished, or bent, rapidly acquire a flexible, brittle texture by a disarrangement of the molecules; consequently the force that maintains the gold in place with the least amount of agitation is the one most likely to accomplish the object desired. At the same time we must not lose sight of the importance of a due consideration of the organized substance against which the gold must be packed and condensed, viz, the enamel and dentin of the teeth. The dentin of a tooth closely resembles true ivory, and like the former, possesses a considerable degree of elasticity or resilience. Take two ivory billiard balls, for instance, strike them together and there is an immediate rebound due to the elasticity of the ivory. Would not the same thing occur in proportion to the amount of surface involved when dentin or enamel is struck solidly with the end of a plugger driven by a mallet?

Three preparations of gold have been mentioned which it was stated might be considered under as many headings, together with the particular force applied to each. We will speak first of cohesive gold. This form of gold brought forth the mallet, and has always been thought of in connection with it. Observe a small pellet of cohesive gold foil, about No. 4, before condensation when it is soft and yielding; but drive its particles into close contact, cohesion takes place and a solid mass is formed of unyielding and friable properties. The first blow has a tendency to drive the cohesive gold pellet into close adaptation with the cavity walls, but succeeding blows falling in the same place thereafter have a tendency to displace it, from the increasing elasticity of the gold and the rebound from the resilient ivory-like substance of the tooth. If with firm and positive hand pressure the same piece of gold is forced against the ivory wall, the only resistance to its remaining there will be the increasing elasticity of the gold, as the rebound will have been entirely overcome by the absence of a shock produced by the blow. In a cavity with thin translucent walls, the color of the gold shows through the dentin and enamel when placed by firm gentle pressure. The same piece of gold condensed with a few sharp blows from a mallet will be less discernible through the cavity walls. What does this indicate? To my mind it can only mean that this layer of gold has been more solidly condensed within its bulk, but in so doing it has been drawn away from its close adaptation to the cavity walls.

We therefore learn from this that over-condensation of cohesive gold by mallet force may completely destroy the close contact of the gold to the tooth which was obtained in the beginning. It is a safe estimate that one-fourth of the all-cohesive gold fillings put in—in many cases by experienced operators—are loose when the patient is dismissed from the chair; this being caused in many cases by too much malleting. A little practical suggestion of mine published some years ago might be mentioned in this connection. To detect a rocking filling which is not discernible to the eye, about the time of finishing tack one end of a strip of gold two inches long to the filling, allowing it to stand up at right angles. Now tap the filling first on one edge and then on the other and observe the end of the strip of gold move through space, showing the unsteadiness of the foundation. From these observations, I feel convinced that even when using cohesive gold alone, the combination of the firm pressure of the hand and mallet force will give the best results, of course allowing the mallet to predominate.

In soft or non-cohesive gold foil there is little or no tendency of the gold to assume an elastic, friable condition; it can therefore be used in greater bulk, and can be forced into absolute contact with the cavity walls by either hand pressure or mallet force—the former, in this instance, should always predominate. But it should always be borne in mind that non-cohesive gold can also be overmalleted. When once it has become thoroughly condensed, each blow of the mallet thereafter—being conducted through the solid mass to the resilient ivory—causes a rebound endangering the perfect contact. This can, of course, be more easily restored with this form of gold by again applying hand pressure, whereas with cohesive gold it is almost impossible to restore it by any kind of energy.

The force necessary for the condensation of the fibrous forms of gold should be the same as that for the other forms of cohesive gold, with the mallet force predominating, and of course always taking due care to avoid over-condensation.

The crystal forms of gold can apparently be condensed in greater bulk than the cohesive foils, but this to some extent is a delusion. It takes just as much force and care to make a solid mass of fibrous gold as of any other form, and in all probability the cohesion set up between the fine particles is never quite as strong as that between the particles of the flat surfaces of foil.

By following closely the gist of this paper, it will readily be discovered that its main point of merit is in the nature of a plea for conservatism and moderation in the use of the various forms of mallets, and an argument in favor of the "old reliable" positive pressure methods of long ago.

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CORRESPONDENCE.

DENTISTRY ON THE PORTUGUESE WEST COAST OF AFRICA.

To the Editor of the Dental Cosmos:

Sir,—In looking over the November 1904 issue of the Dental Cosmos, I was very much interested in the letter of Dr. Paul T. Carrington of Bankok, Siam, entitled, "Some Observations from the Tropics."

As I have been on the Portuguese west coast of Africa for the past year, perhaps a few of my observations and experiences in regard to the practice of dentistry in this climate might interest you and your readers.

As in Siam, there are no dental organizations; in fact, I am the only dentist on this coast, and having journeyed from the island of St. Thomas to Mossamedes, practicing in all the principal ports, I can speak from experience in regard to the great influence of these malarial, tropical climates, and aside from climatic and social conditions, dentistry in these parts is no sinecure.

St. Thomas, Benguella, and Novo Redondo are three of the most unhealthy spots on this coast. Malaria in all its forms—from the light intermittent fevers to the pernicious and black-water fevers—is rampant, causing the European population during the hot and humid season to suffer greatly. As a result, almost everyone suffers from general anemia, and from nerves shattered by the daily, never-ending use of quinin.

In such places, the slightest operation was always a source of worry to me, but in Loanda, the climate being better, the results were correspondingly better. Mossamedes is probably the healthiest town on the whole west coast of Africa, and as a result I have experienced no more trouble here than I might have expected in Europe. Therefore it will be understood that what I say applies in general to St. Thomas, Benguella, and Novo Redondo.

Extractions. My dental library consists of my college and a few other textbooks, and a large number of back numbers of the Cosmos. In all of these I can find practically nothing regarding a condition that has caused me more worriment than all other conditions combined. I refer to what I believe is known as "dry socket." This condition has occurred so often that I have grown to dread extracting teeth. At first I thought the trouble due to the cocain solution I used, but as it existed just the same after I had ceased using injections, I decided I had been mistaken. The first case I had of this condition occurred in St. Thomas, and as it is typical of the others, I shall describe it.

The patient was very anemic, having recently recovered from a fever. The tooth was a very badly decayed upper second molar, which I extracted, then washing out the socket with a weak solution of carbolic acid, as is my custom. I noticed that the tissues bled but slightly. The next day the patient returned complaining of intense pain in the socket. The face was very slightly swollen, the socket open and empty, and the bone white and bloodless. During the next few days the gums sloughed considerably, exposing the alveolar process. After ten days the bone of the socket bled slightly in response to pricking it with a pointed instrument, and after this the healing was rapid. The exposed parts of the alveolar process were afterward exfoliated. The treatment consisted of daily washings with carbolic acid solution, pricking the gums and bone of the socket to stimulate bleeding, and the packing of the socket lightly with cotton saturated with oil of eucalyptus, to which a small amount of iodoform was added. The socket pained less when not exposed to the fluids of the mouth. All of these cases were attended with slight necrosis.

My opinion that the condition was not due to the injections of cocain was strengthened by the fact that I treated a comparatively large number of cases of necrosis of the jaws due to this condition, the worst of these occurring in Benguella. Shortly after my arrival the patient came to me complaining of pains in the jaw, his mouth always having a very bad taste and odor, and that he vomited very often. He said that some five weeks previously a local barber had extracted one of his teeth, a lower third molar. Examination showed two fistulæ, through which the pus was constantly passing into the mouth. Opening the necrotic cavity, I found the disease had extended considerably up the ramus and forward along the alveolar process. As my bottle of pyrozone had been broken during the voyage, and as the local pharmacy had practically none of the remedies commonly used in cases of necrosis, I had to use very simple remedies.

The treatment consisted in scraping away the dead bone, and washing out the cavity with the carbolic acid solution used warm. The bone was then painted with tincture of iodin one-half strength, and the cavity packed with the cotton, oil of eucalyptus, and iodoform, as in the cases of dry socket. This treatment was continued daily at first, then at longer intervals as the case grew better. After two months' treatment the case was discharged cured.

Pericementitis. The extraction of pulps is generally followed by more or less severe pericementitis. In all cases where I have used cocain for this purpose, the pericementitis has been severe and of long standing. In several cases the teeth have been very sensitive a month after extracting the pulp, notwithstanding all treatment.

Neuralgia. This is very common, especially among the white women. It usually begins with some dental trouble, but persists after the teeth have been cared for. Often a very slight operation upon the teeth was sufficient to start neuralgic pains which lasted for days. I have had the very best results with antikamnia in five-grain doses every three hours.

The healing of wounds. In almost all cases this is very slow, as a wound that would be insignificant in almost any other part of the world often assumes alarming proportions here. This is especially true in the case of the natives, although they often have medical treatment.

These various conditions are, I believe, due to the following: The very bad climate; the fevers and the resultant general anemia, the effects of quinin, and also to the great change in climate through which the majority of the white population have passed.

Eruption of teeth. In regard to the early eruption of the permanent teeth in the tropics I can only corroborate the observations of others. I have at present a young patient who has just reached her seventh birthday, who lacks only the canines, second and third molars.

Care of the teeth. Almost all the Europeans are Portuguese, and as a rule they take very good care of their teeth. The natives have very fine teeth, probably due to plain, rough food, and to their habit of cleaning them. Their cleanliness in this respect is more remarkable from the fact that in all other things they are extremely dirty. They use for this purpose a piece of specially strong-fibered wood, which they chew at one end until the fibers are well exposed, forming a sort of brush. This they use almost constantly, with the result that their teeth are the most beautiful I have ever seen.

Yours truly,

NORMAN H. LAUGHLIN.

MOSSAMEDES, S. W. AFRICA,
February 10, 1906.

PROCEEDINGS OF SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, October 1905.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, October 17, 1905, at the Academy of Medicine, No. 17 West Forty-third street, New York city.

The president, Dr. John I. Hart, occupied the chair.

The Secretary read the minutes of the last meeting, which were approved.

NEW BUSINESS.

Dr. W. W. WALKER. Some three or four years ago, when Dr. Sailer held office in this society—I think he was curator—he sent to my office some microscopes which belonged to the society, and which have been in my office ever since. I was to make a report on what I had done with them, which has been very little, as I have had but little time. I thought some young practitioner could take and use them, and report to the society. Dr. Sailer also turned over to me this bottle containing the ballots cast at the first meeting of this organization, held at the office of Drs. Francis and Carr. Through the glass can be seen the names of some of the first members—Drs. Francis, Hurd, Horn, Perrine, William Carr, Northrop, and Marvin. I hope it will be kept with the archives of the society.

I suggest that this microscope be repaired, either at my expense or at the expense of the society, and then let some young enterprising dentist use it and derive what benefit he may from it. Years ago, when I was a boy, I called on Dr. Varney for something; he had that microscope and was working with it. It is a fine instrument, and someone who would use it ought to have it.

Dr. Jarvie. I move that this bottle containing these first ballots be placed in our museum, as it is a very interesting relic of earlier days.

The motion was carried.

The paper of the evening by Dr. Sinclair Tousey, entitled: "Recent Work with the X Ray and High-Frequency Currents in the Diagnosis of Dental Cases and in the Treatment of Pyorrhea and Cancer" was then read. The paper was illustrated by lantern slides.

[This paper is printed in full at page 637 of the present issue of the Cosmos.]

Dr. Tousey then gave a practical demonstration of the working of the X-ray machine, and took several radiographs, which he afterward developed.

Discussion.

Dr. Walker. In reference to the placing of little lead probes in the pyorrheal pockets to show their extent: Have you any pyorrhea patients under your care, in the case of whom you have taken radiographs with these little lead instruments in position, and then taken pictures after the pockets have filled in so that you could not put these instruments down there?

Dr. Tousey. No, sir, I have not. I have cases of pyorrhea under treatment, but have not taken any pictures with the lead probes in the pyorrheal pockets.

Dr. Jarvie. Would a calcareous deposit show in a picture of this kind?

Dr. Tousey. That is a question that has been asked before, and is an important one. I have not taken any pictures in which it did show, but I think it would, if present.

Dr. G. Lenox Curtis. Dr. Tousey's paper is in many respects a very valuable one, and is to be commended both for its accuracy of detail, and for its completeness so far as it relates to his methods of using the X ray. Many of his suggestions are already familiar to those who are acquainted with the subject, and especially to those who are familiar with his previous writings. They are, however, of enough practical interest to bear repetition and further discussion. The part of the paper pertaining to X-ray devices and their technique seems hardly necessary, for I doubt if there are many present who possess enough knowledge upon the subject to fully appreciate it; yet if only one person present is benefitted by it, the paper is worth all the time that has been given to its preparation and reading.

I feel sure that Dr. Tousey has succeeded in so modifying the X-ray outfit that more definite and perfect results in the treatment of dental affections and conditions can now be secured than by the dental devices formerly employed. His alertness in making improvements, his cautiousness in their use, and his fairness in not claiming too much for them, are traits upon which congratulations are due him. I think that in the instances where he points out the ways in which the X ray is useful in aiding the diagnosis of cases of every description with which the dentist or oral surgeon has to deal, he has told nearly if not quite all that is of real value to the profession. I appreciate his conservative statements in regard to the cases he has treated, for it will be noticed that he does not claim to have made any cures of primary affections. It is generally conceded by those of the medical profession who have had the most experience in the use of the X ray, that its chief value consists in the aid it affords in diagnosis by locating surgical conditions, and in this respect it is most helpful to the dentist in assisting him to locate malposed teeth, fractures, broken and lost instruments, etc., as pointed out by the essayist.

Every abnormal condition of the head or of other parts cannot be accurately shown by a skiagraph. In fact, I have found it impossible to get any intelligent definition in some pictures which have been made for me by experts. Perhaps the essayist has had a similar experience and can tell us why this is the case.

In the case of a transplanted tooth to which Dr. Tousey refers, and upon which I have since operated, it may interest you to know that the history of the case shows that the upper lateral incisor had been treated for several years unsuccessfully, and as a last resort the dentist decided to extract the tooth, although it was firmly seated, and transplant a natural root with an artificial crown. This was done, the diseased socket was curetted, and all diseased tissue removed. The prosthetic effect of this procedure was all that could be desired, but the discharge from the fistulous opening continued, and the surrounding tissues remained congested. The root, however, became firmly attached.

After a year or more had elapsed, during which time little else had been done besides the application of counter-irritants, it was noticed that there was a free discharge of pus both from the fistula and from the gingivo-mesial margin.

The usual cleansing and stimulating treatment was again resorted to but to no purpose, for, as the X ray showed, the absorption of the root was almost complete, there remaining little beyond a periosteal attachment to the palato-distal surfaces.

Here is another instance of the inaccuracy of the picture produced by the X ray. The skiagraph leads one to believe that the upper third of the central incisor had suffered the same fate as that which befell the transplanted root. The operation, however, proved that the dental process between the roots of the lateral and central incisors had been completely destroyed, and that a mass of granulations resting upon the root of the central incisors gave it the appearance of having been absorbed; as the root was intact except that part of the peridental membrane under the granulations. The pulp of the tooth was found to be in a low state of vitality. All of the necrotic tissue down to within an eighth of an inch of the artificial crown was burred away, and here I found a healthy attachment to the disto-palatal surface as already described. As the patient did not want to part with the crown at this time, it was left undisturbed hoping that it would prove useful for a few years more. It seems to me that better results would have been attained had the dentist first in charge of the case amputated the diseased portion of the root of the patient's own tooth and removed the diseased tissue above it, instead of extracting the tooth and subsequently transplanting it; for it is well known that the good results of transplantation and implantation are too often of only temporary duration.

The author's dental mirror plate-holder methods of holding films between the teeth and his magnifying fluoroscope are unique and clever in construction, and will doubtless prove to be very useful.

Dr. Tousey has very kindly permitted me to examine a number of his radiographs, among which is an antero-posterior exposure. Although the picture was clear, it was lacking in plainness of detail. I have secured as satisfactory results as are here shown by looking through the fluoroscope with my back turned toward the X ray. Upon the fluoroscope may be seen the formation of all parts of the skull and brain above and back of the eyes. Dr. Tousey's method of determining the strength of the X ray is one of the most practical things contained in the paper.

I would like to ask if the gratifying results accruing from the Friedlander shield are not largely due to the accumulation and concentration of the rays within the shield, and their forcible projection through the small aperture upon the part exposed, thus not only restricting the time of exposure, but also intensifying the therapeutic effect.

There is a wide divergence of opinion in regard to the curative effect of the X ray upon any disease, and its value in the treatment of cancer, except in cases of epithelioma, is seriously questioned. I presume the essayist will tell you that its principal benefit in these cases is limited to the improvement it causes in the general health of the patient rather than by its effect upon the growth itself, except, possibly, in the superficial manifestations he speaks of where the mucous membrane and the skin are the only parts effected. It remains to be proved, I think, whether the delicate ray—the use of which Dr. Tousey advocates—will reach the deeper seated growths which seem to baffle the stronger rays usually employed. But when we see the havoc that has been wrought upon healthy tissue, and the disastrous effects which often follow the treatment of these cases by the X ray in ordinary use, we cannot avoid questioning its real utility. Moreover, some authors claim that in patients who have been treated for cancerous disease of superficial surfaces, the disease in the affected region often disappears only to reappear in deeper seated and more vital parts. Such results are surely dearly bought and can hardly be considered good therapy.

When it is definitely understood that cancer, as presented for treatment, is only the secondary manifestation of a primary disease which pervades the entire system —as described by me in a paper published in the *Medical Times* during the past year—it will be evident that the only way of exterminating this disease is by systemic treatment. My efforts in this direction are well known to many with whom I am in close touch, and as soon as I may have a sufficient number of cases to warrant bringing my method of treating these cases to the attention of the profession, I expect to be able to demonstrate that all forms of cancer can be cured without the knife or local treatment. Already I have succeeded in restoring some cases which surgeons refused to operate upon because of their hopelessness. The beneficial results of the X ray in the treatment of pyorrhea alveolaris as presented by the author, should, I think, be cautiously accepted. Upon asking him if he believed a case of genuine pyorrhea alveolaris could be cured by *any* ray, without previous adequate surgical treatment, he expressed a doubt. He said he had only applied the treatment after thorough dental treatment had been given. His ground here is well taken, for I know by experience the impossibility of such a task.

In the case of W. H., as the author states, only the "ordinary dental treatment" was given. Now everyone who has given any attention to the study and treatment of this disease, knows that the "ordinary dental treatment" consists of little else beyond removing the superficial calcareous deposits about the teeth, applying some stimulating application, and prescribing a mouth-wash. I have many times denounced this pernicious practice which is delusive to both operator and patient, as it generally proves to be injurious to the patient, and a boomerang to the operator; for when the patient returns later with the disease unchecked, the operator is obliged to shield himself by saying, in his ignorance, that the disease is incurable. If he were telling the truth, his lack of success would be excusable, and if his knowledge does not include a way to radically remedy the evil he has only palliated, he should candidly say, "This is the best I can do for you," and permit his patient to seek adequate service and help elsewhere.

I must allow, however, as I have learned by personal experience, that after proper surgical treatment has been given, restoration of the circulation in the gums and processes is in some materially hastened by ozonation.

One reason why dentists so often fail in the treatment of this disease is because they do not have sufficient medical knowledge to recognize that the general physical condition of the patient needs to be improved. It may be possible to remove the local irritation and congestion, but unless the primary cause of the disease is corrected—as was evidently not done in the case of the Mexican girl mentioned by the author—a cure cannot reasonably be expected. If the case of W. H. has been permanently cured by the use of the X ray after "ordinary dental treatment" had failed, I question that the disease was other than gingivitis simplex. The essayist in his statement that the X-ray treatment is little else than an adjunct to proper surgical treatment of these cases has given in a nutshell the value of the treatment in pyorrhea alveolaris, which in addition, however, benefits the general system through the ozone effects. The modesty of the claims the essayist makes for the effects produced by the X ray in pyorrhea is commendable, and if his paper be carefully studied, no one will be likely to believe that the X ray, or any other ray, is alone to be depended upon in the treatment of this serious affection.

We must give Dr. Tousey great credit for his ingenuity in the preparation of lantern slides for oral cases.

Dr. W. B. Dills. The essayist has very forcibly depicted the use of the X ray, and also the use of the different instruments which he has devised for such work. As to the film-holder he has shown us this evening, I think a better skiagraph may be taken with less work, more assurance of success, and with less distortion of the teeth, a smaller size film be used—$1\frac{1}{4}$ by $1\frac{1}{2}$ inclosed in soft rubber—held in position by the fingers of the operator, the head being held in the proper position.

Dr. M. I Schamberg. I had the pleasure of coming before this body two years ago with a paper on the same subject, and at that time endeavored to show by means of slides projected upon the screen the results of radiography and radio-therapy about the face and jaws. There have been marked advances made since then, and though our results are far better than those of a few years ago, there is still room for improvement. The devices shown by Dr. Tousey to facilitate accurate dental diagnosis indicate the progress that is being made in dental X-ray work. The method he advocates of placing the film horizontally in the mouth is extremely valuable in a proportion of cases, but the distortion produced limits its use to those conditions which cannot be reached by the methods already in vogue.

The pictures that I will now throw upon the screen illustrate the comparative ease with which radiographs of other parts of the body can be made. As evidence of the therapeutic value of the X ray, the following pictures of acne, lupus, and epithelioma involving the face are shown. If the X ray will exert the influence upon the skin of the face that is shown in these pictures, it should similarly affect pathological conditions of the mucous membrane of the mouth. Most deep-seated cancers of the mouth do not respond so well to X-ray treatment, but the superficial growths if seen in time can be cured by this form of treatment. Inoperable cases of oral carcinoma are often treated by the rays for the relief from pain that is afforded. The micro-photographs upon the screen were made from an epithelioma within the mouth which disappeared under the influence of the X ray. I have seen the patient recently and there has been no evidence of recurrence.

The question has been asked whether deposits upon the teeth can be shown in X-ray pictures. Unless the deposit is a large mass of considerable density it cannot be seen in a radiograph. It is often difficult to detect some forms of deposit upon the teeth even with fine instruments and dexterous fingers. The picture upon the screen shows a pyorrheal pocket which has caused a separation of the upper central incisors.

Dr. Jarvie. Was that separation between the incisors consequent upon the deposit of tartar?

Dr. Schamberg. I do not believe it to be due to the deposit of tartar. It was evidently caused by an inflammatory condition of the peridental tissues.

Dr. Jarvie. You do not think the inflammatory tissue was due to calcareous deposit?

Dr. Schamberg. Yes, indirectly. The deposits are not detectable in radiographs. Deposits upon the roots of teeth are frequently so minute that they are scarcely perceptible to the eye even after the teeth are removed, and still they are a source of irritation.

Dr. RHEIN. You can see the irregularity in the picture. It has a distinct indentation.

Dr. SCHAMBERG. That tooth has an irregular outline, but it is not due to deposits. I wish here to take exception to those practitioners who say that pyorrhea is incurable, and who permit their patients on that account to go untreated. It is equally a mistake to say that pyorrhea can be cured by X-ray treatment alone. Every case requires considerable study to determine its constitutional as well as local causes. After a thorough scaling has been performed, the X ray may prove a valuable adjunct in the management of the case. I have come to the belief that few operators scale teeth thoroughly, and I have reached that conclusion since sending a patient to Dr. Rhein several years ago. He proved to me at that time that I was only scaling teeth about one-tenth as much as is required. The purpose of the X ray is to penetrate the tissues which have not been reached by the scaler or the curette, and to destroy the micro-organisms there loquired. The purpose of the X ray is to the organisms which have migrated into the peridental tissues that causes the absorption of the process. Just as in gleet the gonococci migrate into the urethral wall and make it a difficult disease to cure, so in Riggs' disease the migration of organisms into the peridental tissues makes it refractory to treatment. Dr. Price of Cleveland demonstrated several years ago that the X ray would without previous scaling of the roots stop the pus discharge in pyorrhea alveolaris. It has been definitely proved that the X ray inhibits the action of pus organisms, so that while it is essential that other forms of treatment be adopted in Riggs' disease, it is equally important that they be supplemented by X-ray applications. With these few remarks I hope to supplement Dr. Tousey's remarks on the value of the X ray as a diagnostic and therapeutic agent, and to make clearer the stand which I know he takes in regard to pyorrhea. Recently in talking over the subject with him at Rutland, Vermont, he expressed himself as holding much the same views as myself, and I am quite sure he does not make claims for curing pyorrhea with X-ray treatment alone.

Dr. TOUSEY (closing the discussion). I am very much obliged to the gentlemen who have come here to supplement the statements in the paper, and to discuss it. It is very important to realize in the treatment of pyorrhea that the X ray should not be depended upon as the main feature of the treatment; but I am firmly convinced that as an adjunct to the proper mechanical and chemical treatment, it is very valuable. I have had several cases besides those I gave in detail tonight, in which the relief of pain and the lessening of suppuration of the gums have been very marked, immediately following the addition of the X ray to the treatment given by the dentist.

I have a theory of my own in regard to the X ray, and in talking with Dr. Curtis the other night found that his impression was somewhat similar; that is, that the X ray in taking a picture probably has no effect on living tissues at all; but if given vigorously to produce an effect on the tissues, that effect is almost invariably a noxious one upon healthy tissues. Where it is used for treatment, we need to study the vigorousness or energy of the applications, so that the sound tissues may be given the opportunity of recovering between the treatments. X-ray operators exposed their hands repeatedly in the beginning; they would hold the hand up and use it as a radiometer to test the degree of penetration. Even mild exposures at too frequent intervals do not allow the healthy tissues to completely recover—as in those cases where doctors' hands have been injured by the X ray. My idea has been that the cancer cells and the organisms which keep up the trouble in pyorrhea are not so resistant; they are more susceptible, and by study of the subject, applications of such strength and frequency may be made that the healthy tissues will recover between the applications; but the cancer cells, or the lupoid cells, or whatever they may be, owing to their lesser vitality will not completely recover. We get the desired cumulative effect on the diseased tissues, without deleterious effect on the healthy tissue.

As to Dr. Dill's statement that the film-holder does not give quite as good a definition as the one we obtain by the smaller films held directly against the mucous membrane, that statement is correct, and ever since I devised this method I have continued making the small picture to obtain as good detail as I possibly could, and as accurately depicting the length of the tooth, but I have supplemented it in every case where it was called for by taking one of these large pictures, which gives a bird's-eye view of seven, eight, or ten teeth, and also gives an idea of the general relations, and some of the further details of the structure better than would be obtained from the small one alone. I hope some day we will be able to apply the X ray in such a way that all we shall require to do will be to put one of these large films in the patient's mouth. It is a simpler arrangement, although I have not been quite satisfied with it, so far, when used to the exclusion of all other methods.

Dr. TRACY. I would like to make a motion that we extend a hearty vote of thanks to our essayist, Dr. Tousey, and to the gentlemen who have taken part in the discussion.

The motion was carried.

Adjournment.

WM. B. DUNNING, D.D.S.,
Editor N. Y. Odont. Soc.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Monthly Meeting, January 1906.

THE First District Dental Society of the State of New York held a regular monthly meeting, Tuesday evening, January 9, 1906, at the Academy of Medicine, No. 17 West Forty-third street, New York city, the president, Dr. Arthur L. Swift, in the chair.

Dr. Nelson T. Shields, chairman of the Clinic Committee, read a report of the anniversary clinics held in December.

INCIDENTS OF OFFICE PRACTICE.

Dr. SAMUEL HESS. I would like to present an interesting case of arrested development of the enamel. Looking into the mouth of the patient, the absence of any enamel covering on both anterior and posterior teeth is at once noticeable, the entire denture seemingly having undergone an extensive erosion process.

The family history seems good, and the condition of the child from infancy has been excellent.

I have not been able to ascertain whether pre-natal disturbances could be made to account for the extensive erosion. I have likewise been unable to discover any reason why any process of malnutrition should have resulted in such a pronounced dental deformity, and am therefore somewhat in the dark as to the etiology of the condition.

If the society permit, I would like to present the patient—a child of eleven years—for the purpose of securing the opinion of its members, both as to the etiology and the ultimate amelioration of the condition.

The PRESIDENT. It is a very interesting case, and I am very much obliged to the gentleman for bringing it before us. I trust those present will give their opinions.

Dr. HART. I think it might be interesting to state to the members that from a query made just before the meeting, we ascertained that this little girl had not suffered at the time these teeth were calcifying from any of the diseases of children accompanied by a high temperature. Both the father and mother are healthy. The enamel not having formed at the time of eruption, we cannot look for the formation of any now, and I am inclined to think that when the patient is older, the best treatment in the anterior teeth will be to use the type of porcelain jacket caps which were shown at a clinic about a year ago. It would be wiser to defer such treatment, though, until the pulps are a little smaller, which would probably be in two or three years. In the meantime all possible prophylactic measures should be used to prevent those gingival surfaces from decalcifying, a condition which might be accomplished by following a thorough local alkaline treatment. It is a very unusual case.

Dr. H. W. GILLETT. I have a similar case to the one shown. It is not quite so bad, because there is some enamel. There are nodules of enamel, particularly on the molars. My case is due to a serious illness of the child at the time the teeth were developing, and I have been holding in reserve the plan Dr. Hart mentioned. I see nothing else that can be done in this case. It is complicated by a malocclusion, and possibly that condition may be treated at once, with advantage to the child.

Dr. J. GRANT PEASE. There is one point of peculiarity in this case. Dr. Hess says that the child does not experience any discomfort from cold or heat, or from sweets or acids. As a general rule, teeth devoid of enamel, like these, are very sensitive. I asked if he had tried the ice test to see if the pulps were at all sensitive; he said, No. It would be very interesting to know the condition of those pulps.

Dr. SHIELDS. If the history of this case were thoroughly known, I think it would be found that at the time of the enamel formation, there was a serious constitutional trouble that interrupted the process. The fact that the grooves or little eroded places are all in straight lines is the reason on which I base my opinion. It has not occurred since the teeth erupted. The softening of the teeth is due to the character of saliva. The temperament and constitution of the child we are not acquainted with, but I think if an analysis of the saliva were to be made it would be found to be less alkaline than normal. I would not touch those teeth for a number of years, but would merely prescribe a diligent prophylaxis, and at the end of a period of from five to ten years I would do the best that could be done with the condition as it would then present itself. In the meantime, do all you can to prevent the erosion from further increasing.

Dr. GLADSTONE GOODE. One of the second molars has one cusp just erupting through the gum, with a seemingly good coating of enamel, and it would be interesting for us to know the condition of those teeth after complete eruption. Perhaps the canine will be much better formed than any of the other teeth.

Dr. GILLETT. As to the condition of the pulps, I would suggest that the radiographs Dr. Tousey has lately exhibited to me show the pulp-chambers very clearly, and an X-ray examination might be helpful in determining their condition.

Dr. H. CLAY FERRIS. I would advise that the case be put in the hands of an orthodontist immediately. At the present time her teeth are more susceptible to the ravages of disease than ordinary teeth, and that they are in malocclusion is self-evident in the facial lines. The occlusion is very bad, and if the teeth were in normal occlusion, they would be less likely to decay. The porcelain-shell crowning I would consider an advisable procedure at a later date.

The PRESIDENT. Dr. Hess, we would be very glad to have you inform us of the condition of the case later, when the canines erupt.

Dr. HESS. If I can keep the child in view, I shall be glad to do so.

Dr. DUNNING. I would suggest that Dr. Hess give us his own views upon the subject.

Dr. HESS. They were about similar to those expressed—to do nothing at the present time, and to postpone all operative intervention until the child is a little older.

The President. How about correcting the occlusion?

Dr. Hess. To my mind, the teeth are not now in such condition as to permit of the use of any regulating appliance, without materially injuring the teeth. It is my intent to await the eruption of both the second molars and the canines, and to note the structure of these teeth before proceeding farther in the treatment of the case.

Dr. E. E. Minner. Before attempting to regulate the teeth, it is well to consider that the present condition of malocclusion is of considerable advantage. Nearly all of the teeth will eventually have to be crowned, and a normal occlusion may then be obtained by such crown work, as the denuded condition of the teeth may admit of such work without further materially mutilating the teeth or destroying the pulps.

The abnormal occlusion of the anterior teeth will readily permit of the use of porcelain-jacket crowns, and with very little grinding. Thus the pulps will be kept alive, and the additional thickness of porcelain will not be noticeable.

The president then announced that Dr. N. T. Shields would read a paper on "Pyorrhea Alveolaris and the Splinting of Loosened Teeth."

The society adjourned after the liberal discussion which the paper elicited.

B. C. Nash, *Secretary.*

NORTHEASTERN DENTAL ASSOCIATION.

Eleventh Annual Convention.

Wednesday—*Morning Session.*

The eleventh annual convention of the Northeastern Dental Association was held October 4, 5, and 6, 1905, in Baxter Hall, Rutland, Vt.

The convention was called to order Wednesday, October 4th, at 11 A.M., by the president, Dr. Thomas Mound, Rutland, Vt.

The first order of business was the reading of the minutes of the last meeting.

Dr. W. E. Boardman moved that the reading of the minutes be dispensed with, as the Transactions had appeared in printed form and had been furnished to each member of the society.

The motion was carried.

After the transaction of some routine business, motion was made and carried to adjourn until 2 P.M.

Wednesday—*Afternoon Session.*

The Wednesday afternoon session was called to order at 2 o'clock by the president, Dr. Mound.

The Mayor of Rutland, who was to make the address of welcome to the association, being out of the city, the address was dispensed with.

The next order of business being the President's address, Dr. Henry McManus, Hartford, Conn., ex-president, was called to the chair, and Dr. Mound read his annual address.

Dr. Boardman moved that a committee of three be appointed by the chair to consider the President's address and report at a later session.

The motion was carried.

Dr. McManus appointed the following as the committee on the President's address: A. J. Flanagan, Springfield, Mass.; F. T. Murlless, Jr., Windsor Locks, Conn.; C. F. Meacham, Bellows Falls, Vt.

The President resumed the chair, and announced as the next order of business the reading of a paper by Dr. SINCLAIR TOUSEY, New York, N. Y., on "The Use of the X Ray and High-Frequency Currents in Dentistry."

Dr. Tousey's paper was passed, and the next order of business was the reading of a paper by Dr. MARTIN C. TRACY, New York city, on "Am I My Brother's Keeper?"

After the discussion of Dr. Tracy's paper motion was made and carried to adjourn until the evening session at 8 o'clock.

WEDNESDAY—*Evening Session.*

The meeting was called to order at 8 P.M. by the president, Dr. Mound.

The first order of business was the reading of a paper by Dr. N. G. REOCH, Boston, Mass., entitled "A Plea for a Proper Appreciation of Occlusion," as follows:

A PLEA FOR A PROPER APPRECIATION OF OCCLUSION.

Upon a proper appreciation of occlusion—the basic principle of orthodontia—depends the success or the utter failure of our cases. To have the knowledge of occlusion that is essential to the orthodontist, one must be a student of facial art. The relation of the teeth, jaws, and other facial bones are all interdependent. In a normally developed individual, with the teeth all present and in normal occlusion, the relationship between facial line and jaws will of necessity be harmonious. But this relationship of facial lines and jaws varies with different individuals. For instance, the prehensile, prognathous type of the African negro varies to a marked degree from the orthognathous European, but still the relationship of the teeth to the bony anatomy of the face and head is perfectly normal for each type. With the progress of evolution and natural selection, the facial angle of the negro of our acquaintance is fast approaching that of the European.

With the scientific knowledge we have gleaned upon orthodontic problems within the last few years, the man who extracts teeth in the treatment of cases of protruding upper incisors, in crowded conditions of the teeth in the arches, or in almost any malocclusion whatever—such a man, I say, must necessarily have an utter disregard for the principles of occlusion, and an immense amount of courage to follow such a procedure in the face of the vast accumulation of evidence showing the fallacy of such a method; or else he must be in entire ignorance of the principles of occlusion, and truly to be pitied. Do not misunderstand me. I do not wish to take the ground that a man should *never* extract a tooth in the treatment of cases. But I believe the necessity for such sacrifice is rare indeed, and when required it is always in cases already mutilated. I do believe, however, that any case whatever is amenable to treatment without extraction, if such treatment be given soon enough. To get the most pleasing results, cases must be treated early in life. Because in some cases treated after complete osseous development we cannot obtain absolutely ideal results, the inference must not be drawn that the principle of such treatment is wrong.

At the annual meeting of the American Society of Orthodontists held in Chicago last week, an artist—Mr. Carl Werntz of the Academy of Fine Arts—criticized the faces of patients of various members of the society. When the profile of the face was shown, the artist analyzed the face, making suggestions whereby, if certain lines could be altered, the face could be improved. In almost every instance, yes, I may say in each instance, his suggestions were sustained in the final pictures. In a few of the cases of distal occlusion of the mandible, he recommended the carrying of the point of the chin still farther forward. But as we all know, in many such cases there is a lack of development in the mental region; and even after the teeth are brought into proper relationship, there still remains something to be desired in certain features of the face. The artist did not know the anatomy of the teeth, and their dependence upon each other and upon the jaws for the harmony of the whole masticating apparatus. He saw the faces with the eye of the artist—a lip too prominent here, a chin receding there, etc. In each instance a study of the casts portrayed the fact that there was some form of malocclusion of the teeth, which when remedied gave to the face the harmonious make-up best suited to the particular type to which the individual belonged. Such criticism, gentlemen, if passed upon an equal number of faces where extraction had been resorted to, would have been adverse—for the results of extraction are always reflected upon the facial lines.

The men advocating extraction (and there are now few) usually do so from a study of the cast of the case. To the casual observer these casts may look well. All he sees is that the teeth "hit." This mode of treatment may have answered in the dark past, but it won't do now. What we of the so-called "new school" desire is that the advocates of extraction should attempt to prove their claims by good casts and honest photographs of faces—not by death-masks.

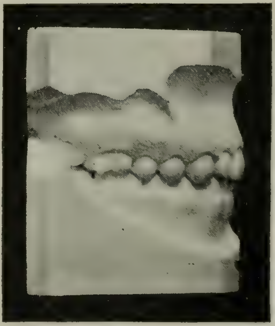
From my limited experience I have found it to be true that a surprisingly large proportion of dentists seem to have a very vague and hazy idea of just what normal occlusion is. If this little paper and the slides I am about to show you will make some of you think deeply upon the subject of occlusion, and perhaps spur you on into a closer study of it in the diagnosis of cases, I will be amply repaid for any little inconvenience I may have been subjected to in its preparation and in that of the lantern slides.

Discussion.

Dr. ALFRED P. ROGERS, Fall River, Mass. Without a knowledge of diagnosis, a man who attempts the correction of malocclusion reminds me of a ship captain without compass and chart, trying to make a distant harbor; but to him who is given an understanding of diagnosis is given both compass and chart to guide him; his successful voyage is assured, providing, of course, that he is a good captain. What would you think of a physician who, when called upon to treat your sick little ones, proceeded to administer drugs without first diagnosing the disease. You would not honor or respect him, would you? Yet there are among us men who undertake the treatment of malocclusion of the teeth without the slightest attempt at diagnosis, and without a knowledge of its first principles.

If we wish to be of greater service to our patients, then let us master this all-important matter. If we are convinced that malocclusion sometimes makes speech difficult; if we are led to believe that it sometimes makes proper mastication of food impossible; if we can see that it not infrequently causes hidden sorrow and grief, is it not right that we, a body of dentists, should make ourselves proficient in at least the underlying principles that lead to the correction of these difficulties? We are ready to admit that we have our limitations; all cannot be good orthodontists, or good inlay workers, or good oral surgeons. We must not be ashamed to acknowledge that we are not expert in all things. When a case is presented which is beyond our knowledge, let us be frank with ourselves and honest with our patient, and refer him to one whose ability is acknowledged.

Let me now show you something that I believe will interest you. It is what I consider the first great step in diagnosis —the making of a model of the mouth,



complete, exact, and beautiful. Notice with me, please, the beautifully curved surfaces of the teeth, the grooves, and the inclined planes. You can see the root inclinations, the muscles and their attachments, in fact all that is needed for study is here. I want you to notice, too, that capital and base are trimmed artistically and in harmony. The making of an accurate model, then, is the first great step. If we fail in this, let us halt until we have accomplished it, then do the next thing.

Dr. Reoch's paper was passed, and the next order of business as announced by the President was a lantern exhibition of skiagraphs showing pathological conditions, by Dr. M. I. SCHAMBERG, Philadelphia, Pa.

There being no further business before the convention at this time, motion was made and carried to adjourn until Thursday morning.

THURSDAY—*Afternoon Session.*

The meeting was called to order by the President at 5 o'clock Thursday afternoon.

The first order of business was the report of the Committee on Nominations for officers for the ensuing year. Dr. Flanagan, the chairman, presented the following nominations:

President—Dr. T. J. Barrett, Worcester, Mass.

First Vice-president—Dr. J. E. Power, Providence, R. I.

Second Vice-president—Dr. E. B. Griffith, Bridgeport, Conn.

Secretary—Dr. E. O. Kinsman, Cambridge, Mass.

Assistant Secretary—Dr. C. F. Kreppel, Forest Hills, Mass.

Treasurer—Dr. F. T. Murlless, Jr., Windsor Locks, Conn.

Librarian—C. H. Riggs, Hartford, Conn.

Editor—Dr. David Manson, Burlington, Vt.

Dr. Boardman moved that the report be accepted and that the secretary be instructed to cast one ballot for the entire list of nominations.

The motion was carried and the secretary cast the ballot of the society for the foregoing nominations.

Dr. BOARDMAN. I would like to speak of a matter that is now under advisement in the National Dental Association—the proposed plan of the association owning a journal for the publication of its transactions. A committee has been appointed by the National Dental Association to devise ways and means for owning and controlling such a dental journal. What I desire is to have a committee of three appointed from this association to confer with the committee appointed by the National Dental Association to ascertain what can be done to interest the different societies in this matter, and to induce each society to contribute a sum of money from its treasury for the maintenance of the journal. The scheme that has been suggested is that those societies contributing towards the maintenance of such a journal are to have their transactions published in this journal, and each member of the contributing societies is to receive the journal without cost.

I move, therefore, Mr. President, that a committee of three from this society be appointed by the chair to confer with the committee from the National Dental Association to see what arrangement can be made in this direction, the committee to report to this society at the next annual meeting.

Dr. E. S. ROSENBLUTH. I object to the proposition, which amounts to the spending of the funds of the association for a purpose which will be a total loss. It is a matter which will involve the expenditure of sums of money which the association is not in condition to spend without a practical result. The circulation of the journal would be so limited that the benefits to the society would be limited, and I therefore object not only to the expenditure of funds in this direction, but also to the appointment of a committee to find out what the publication of such a journal would cost, as I consider the proposition highly impracticable.

Dr. BOARDMAN. The appointment of the committee does not involve this society in any expense whatever, as the committee will simply be appointed to confer with the one appointed by the National Dental Association to ascertain what can be done, and what this society will do to forward the project, the committee to report to this association before any action is taken.

Dr. MURLLESS. We have admirable precedents for this scheme. The American Medical Association and the British Dental Association publish their own journals.

Dr. HENRY MCMANUS. I would like to amend the motion of Dr. Boardman to the effect that the committee be composed of Dr. Boardman, in favor of the journal, Dr. Rosenbluth, who is opposed to it, and the secretary and treasurer, who should be neutral on this question.

The motion was carried as amended by Dr. McManus.

Dr. Boardman declined to serve on the committee, and moved that Dr. C. W. Rodgers be appointed in his stead. The motion was carried.

Dr. Maxfield moved that a vote of thanks of the society be extended to the Vermont Marble Company for the courtesy shown the members of the society on their visit to the quarry and shops at Proctor.

The motion was carried.

Dr. Maxfield also moved that a vote of thanks be extended to the Local Committee of Arrangements for their efforts in making the meeting a success, and that the secretary be instructed to write them to that effect.

The motion was carried.

Dr. Rosenbluth moved that a vote of thanks be extended to the essayists and clinicians who had assisted in making the meeting a success, and also to the essayists who were to read essays during the coming sessions.

The motion was carried.

Motion to adjourn was then made and carried.

THURSDAY—*Evening Session.*

The meeting was called to order at 8 o'clock Thursday evening, with the vice-president, Dr. T. J. Barrett, Worcester, Mass., in the chair.

The first order of business for the evening was the reading of a paper by Dr. JAS. C. MONAGHAN, Washington, D. C., Chief of the Department of Commerce and Labor, on "The American Dentist Abroad."

Dr. James McManus moved that a rising vote of thanks be given to Dr. Monaghan for his eloquent address.

The motion was unanimously carried and the audience gave a rising vote of thanks to Dr. Monaghan.

The next order of business as announced by the vice-president, Dr. Barrett, was the reading of a paper by Dr. EUGENE H. SMITH, Boston, Mass., entitled "Extraction as the Proper Method of Treatment in some Cases of Malocclusion."

There being no discussion on Dr. Smith's paper, the Chair announced that an entertainment arranged by the local Committee of Arrangements was awaiting the members of the society at Dunn's Hall, and that all were cordially invited to attend.

The vice-president, Dr. Barrett, then declared the meeting adjourned until Friday morning.

FRIDAY—*Morning Session.*

The meeting was called to order Friday morning at 10 o'clock by the president, Dr. Mound.

The first order of business was a talk by Dr. CHARLES MCMANUS, Hartford, Conn., on "A Proposition for a Dental History," as follows:

Mr. President and Gentlemen,—I have no paper to present. I simply requested a few minutes that I might place the Committee on History of the National Dental Association on record here in regard to the matter of a dental history. In 1898 I presented before this society a paper regarding the necessity for a history of dentistry, and the society at that time passed some resolutions, etc., in regard to the desirability of having such a history. I want to say this morning, that after considerable work in that connection, we have now in the hands of the Committee of the National Dental Association a history fully illustrated from the earliest times up to the beginning of American dentistry. It is a very complete and satisfactory work in every way, and will make a book consisting of about one hundred and thirty thousand words. It is simply required now that we receive first the support of the dentists of the country. It means that if we can secure at least seven hundred subscriptions for the work at five dollars each, there will be placed in the hands of the profession, in the course of a few months, a complete history of dentistry during that most interesting period, by Dr. Vincenzo Guerini, an Italian dentist. Dr. Guerini is an Italian, but he desires particularly that this history be presented to the world in the English language. He is very friendly toward American dentists and wants the work published here. The Committee of the National Association on History—Drs. Kirk, Trueman, and Thorpe—and a number of other gentlemen interested in the work—brought it before the National Dental Association, and it has received the support of that association. Very shortly a statement giving a concise yet full idea of the scope of the work will be sent to every reputable dentist in the country, asking for subscriptions, and if there are seven hundred dentists who are willing to pay five dollars for the work that Dr. Guerini has been spending ten years in preparing, a full and complete history of dentistry up to the beginning of American dentistry can in the course of a few months be placed in the hands of each one who subscribes for it.

Dr. **JAMES McMANUS**, Hartford, Conn. I simply want to emphasize what my son has said in reference to this matter of dental history. In my experience in dentistry I have often been asked questions regarding the early history of dentistry, and, unfortunately, I was unable to give the desired information. As professional men we should know all that can be obtained from history relating to our profession and as I have had the privilege and pleasure of looking over the manuscript by Dr. Guerini, I found it fascinating and wonderful in its fullness and its complete statements of the early progress and early days of dental history. I do want to impress upon all present that if we will only take an interest in this work, and subscribe the small sum required for this vast amount of information, we will certainly have something that we will always value very highly. I hope the circular which will be sent out will be responded to very promptly, and that each and everyone in conversing with brother practitioners will call their attention to it, and induce them to subscribe for the work so that it can be promptly published.

Dr. **E. S. ROSENBLUTH**, Bridgeport, Conn. I move, Mr. President, that a vote of thanks be extended to Dr. Anthony, and to the DENTAL COSMOS for sending him to report our meeting.

The motion was seconded and carried.

The next order of business was the installation of the newly elected president.

Dr. **T. J. BARRETT**, Worcester, Mass., the newly elected president, was conducted to the chair, and accepted the presidency for the ensuing year as follows:

Mr. President and Members of the Northeastern Dental Association,—All that I can say is that I appreciate the confidence that this election indicates you have in me: I appreciate the high honor that has come to me at your hands, and realize fully that to be chosen president of the Northeastern Dental Association is indeed a great honor coming from the hands of the dentists of New England. To be called upon to preside over the deliberations of this association, representing as it does the best men of the dental profession in the New England states, is worthy of the highest appreciation of any man, and I assure you that I appreciate the honor.

This will be my first experience as the president of a dental society. I know my shortcomings, and I trust that you will bear with me and offer me such assistance as will help to make this organization what the members and founders of it intended it should be, and I will endeavor to fulfill the expectations you have of the man you elect as president.

This meeting has been a great success considering the location in which it was held, and the difficulties under which the president and Executive Committee have had to labor. The meeting in my opinion was held too early in the month of October, for many members having just returned home from their vacations, hardly felt in position to devote three days so soon again to a meeting before they were hardly settled down to the work of the year. I think if the meeting be held another year a little later and in a more central place, it will be the success that we all expect from so important an association as the Northeastern.

I thank you again, gentlemen, for the honor you have conferred upon me, and assure you of my best efforts.

Dr. JAMES MCMANUS. I know that all will be pleased to offer thanks to the officers and committees of this association for this meeting, and I move that a vote of thanks be extended to them for the work they have done during the past year.

The motion was carried.

There being no further business before the association, motion was made and carried to adjourn until the next annual session.

THE DENTAL COSMOS
A MONTHLY RECORD OF DENTAL SCIENCE.
Devoted to the Interests of the Profession.

EDITED BY
EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, JUNE 1906.

EDITORIAL DEPARTMENT.

THE DESTRUCTIVE CRITIC.

To those of the dental profession who are interested in developing its resources and furthering all those tendencies which make for its progress, the acute stage of criticism of the muck-rake variety which has recently been making itself manifest in several directions must be anything but encouraging. A disinterested observer anxious to discover what kind of an estimate practitioners of dentistry place upon their own profession would obtain a mixed impression as to its ethical status from a perusal of dental periodicals for the past few months, even if he did not rise from his task convinced that dentistry was a degraded and unholy calling.

When we consider that the world is inclined to judge us by our own estimate, the amount of loose talk, the assaults upon personal character, the wholesale denunciations of our educational institutions, the charges of political trickery in the management of our associations, of self-interest, greed for power and lust for financial results that have been made against persons and institutions, both directly and by innuendo, with such frequency of late would seem sufficient to demand attention.

Let it be remembered that there are two kinds of criticism—one which is constructive in its character and object, that tends to establish the truth by eliminating error; the other destructive in character and object, which deals its blow with such blind aim that the truth as well as the error is injured and the only satisfactory thing accomplished thereby is the pleasure felt by the critic when he has gratified his insane desire to destroy something and thereby attract general attention to himself for the time being—for the destructive critic is always an egotist.

Constructive criticism is essential to progress. Its function is to purify, to purge the error from its interference with truth; it is the essence of true conservatism. But this is not the type of criticism with which we are at present called upon to deal. The egotist is not concerned with anything that does not concern himself; his criticism is therefore of the destructive order when applied to whatever interferes with the attainment of his personal ends. And it is this type of criticism which has recently been much in evidence in our dental periodicals.

Two general lines of attack have been exploited by the destructive dental critic—both of them somewhat ancient and distinctly threadbare from age and over-work; they are dental politics and dental education.

Dental politics is a perennial plant which blooms periodically, but mostly in the springtime with the approach of the annual elections, when the thoughts of the destructive critic turn from the pleasant occupation of reaping the material rewards of his professional skill to the possibilities of righting his personal wrongs. This he would accomplish through the agency of a movement having for its object the practical demonstration of how much better he can direct the affairs of the dental universe than the powers which are *pro tempore* in control of its destinies. Surcharged with this idea, he launches upon his campaign of destructive criticism; his astigmatic vision magnifies the errors or wrongs. to be righted to such magnificent proportions that they obscure his view of the elements of right or good that are involved. In his blind enthusiasm he becomes the propagandist of reform by revolutionary methods—a veritable anarchist, for the time being, who is cheered to greater activity by a gaping crowd of curious spectators the majority of whom are more interested in his antics than they can possibly be in the merits of a case about which they know nothing and care less. This type of activity would be more amusing if it were not a nuisance which is productive of harm in several ways: First, by arousing antagonisms and creating a general sense of uneasiness and distrust, thus diverting energies which should be put to better use; and secondly, when reduced to its lowest terms, while demanding political reform the alternative is too frequently the substitution of the political methods of the self-constituted reformer for those of the existing order. So long as the greed for power and place animates men, and selfishness controls their activities, just that long will the progress of dentistry and the output and character of the work of our professional organizations be hampered by the cry of politics and reform. In our political wrangling we are continually confronted with demonstrations of the truth uttered by the late Henry Ward Beecher, that "Orthodoxy is my doxy, heterodoxy is the other fellow's doxy." It is difficult to suggest a means of relief from this unpleasant state of affairs under existing circumstances, but it would possibly improve matters if the excessive amount of energy expended upon dental politics and the reform of dental politics were diverted into the channel of dental research and the production of a larger volume of really worthy dental literature. This plan would redound to the credit of our profession, and incidentally, while distinctly more arduous, it would furnish the worker a proportionately more direct road to professional eminence and regard than the political reform route.

The destructive critic in politics is ably seconded by his analogue in the sphere of dental education. From the date of the founding of the pioneer dental educational institution of the world until the present time the carping critic has had his fling at the sources from which he learned about all he ever knew of the foundation facts and methods of his profession. He has in many instances squeezed through his final examinations for the degree that he appends to his name, and he straightway becomes a reformer in dental education! He has been to college, knows all about it, has become familiar with the defects in teaching; was unable to learn, and attributes the result to faulty teaching methods. He has utopian visions of an institution where knowledge will soak into the student's consciousness without effort upon his part, where the teaching will be so clear and convincing that in passive ease the student will absorb it all and issue at the close of the course a finished ethical product adorned with skill and knowledge in the superlative degree. When the vision has thus shaped itself he begins his career of destructive criticism of "our present modes of dental education." He writes, he talks his theme, and adds to his reputation as an authority upon a subject of vital importance but about which he knows nothing in a practical way.

The critic of this class has the all too common fault of making broad generalizations upon insufficient data. He has found certain real defects and he damns the whole system, and with the courage of his ignorance injures the credit and standing of the system to which he owes what professional knowledge he possesses. The activities of the class of iconoclasts here under consideration are sufficiently harmful when exhibited within the local limits of the association or professional group where they are first uttered; but when exploited in our periodicals and thus spread before the civilized world they bring discredit upon our institutions and make dentistry a laughing-stock and byword. Let us seriously consider what it means to convert our associations and our publications into laundries for the washing of dirty professional linen, and stop the evident tendency in that direction. The world takes us largely at our own estimate; we have won the right to something better than recent outbursts of the various types of destructive critic would accord us or force us to accept. Where wrong exists let it be set right, but in the name of decency and good order and for the sake of the fair reputation of our profession as a gentlemanly calling let it be done in private and not upon the public highway. There is large opportunity to begin a really useful reform movement right here.

IN RE SAN FRANCISCO.

We publish herewith a letter, recently received from Dr. J. P. Root of Kansas City, which is self-explanatory and which contains a practical suggestion which we heartily approve.

Every little will help, and will help largely in this time of great need. Many who may not feel able to make contributions in cash can do so by the method suggested in Dr. Root's letter. If you cannot contribute in cash, then add your mite to the "scrap pile." The small self-sacrifice necessary to do this is but a fraction of the sacrifice that our suffering brethren in San Francisco are called upon to bear. A little help from each of us will make their burden lighter.

"*THE SCRAP PILE.*"

Kansas City, Mo.,
June 21, 1906.

To the Editor of the Dental Cosmos:

Dear Sir,—Under the heading of "The Scrap Pile" I desire to make a suggestion regarding raising a fund for San Francisco sufferers. From my experience during the last few weeks, the task of acquiring a sum sufficiently large to materially assist those in need is a difficult one, and the "scrap pile" idea evolved from the ease with which a goodly sum was collected in Kansas City a year ago for an event of minor importance. By simply requesting all who were asked to aid, to donate a portion of their gold scraps, several hundred pennyweight soon accumulated.

Now, let every dentist, regardless of the fact whether or not he has paid into other funds, box up at least a portion of his gold scraps, and send them to any dental journal, or to Dr. J. D. Patterson of Kansas City, Mo. (Keith & Perry Bldg.), treasurer of the National Relief Committee, and further assist those in distress.

Yours truly, J. P. Root.

The following letter from Dr. Metcalfe speaks for itself:

San Francisco,
May 18, 1906.

To the Editor of the Dental Cosmos:

Dear Sir,—As a favor will you, through your journal, kindly thank the General Dental Relief Committee of Chicago for their kind assistance to me and many of my brother practitioners who suffered heavy losses in the recent fire here, which put six hundred of our best practitioners upon the street. I assure you that every dentist on receiving the order for the twenty dollars named received it with a smile. This will help some to establish new offices or enable them to do temporary work for many of their suffering patients until such time as conditions will admit of better arrangements.

Thanking all and trusting that those in the East may never meet with such unhappy experiences, I remain

Yours truly, P. Metcalfe,
366 Twelfth ave., San Francisco.

We would also call attention to the resolutions generously adopted by the Alameda County (Cal.) Dental Society embodying a plan for helping our stricken brethren to retain their clientage, as found on page 713 of this issue.

BIBLIOGRAPHICAL.

THE MODERN MASTOID OPERATION. By FREDERICK WHITING, A.M., M.D., Professor of Otology, Cornell University Medical College; Aural Surgeon to New York Eye and Ear Infirmary, etc. Illustrated by 25 Half-tone and 23 Key Plates made from Original Drawings. Philadelphia: P. Blakiston's Son & Co., 1905.

The progressive trend of specialism in both medicine and surgery is clearly exemplified by such works as the one under consideration. The field of investigation of Dr. Whiting, while not topographically extensive, is nevertheless one the importance of which cannot be overestimated, especially if it be remembered that the complications often arising from disease processes in the mastoid cells may lead to involvement of the deeper and more vital cerebral structures.

The author in convincing style describes and comments upon every known method of treatment, and in each case omits no detail that could possibly jeopard the final results. The minuteness with which the author elucidates every surgical step is worthy, indeed, of most favorable criticism.

If surgeons have in the past encountered difficulties in their work in the mastoid region, with Dr. Whiting's book at their command all such doubtful points should be successfully cleared, for in the volume before us the author has recorded not only his own valuable clinical experience, but likewise that of many other distinguished specialists in the field of mastoid surgery.

An appreciation of this work would be incomplete that omitted to make mention of its excellent typographical quality.

J. E.

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REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*La Estomatologia*, Madrid, April 1906.]

DISINFECTION OF THE MOUTH. BY DR. MONTEFUSCO.

Dr. Montefusco has carried on a series of investigations in view of determining a practical method of mouth-disinfection. He first brushed his teeth, then rinsed his mouth thoroughly with distilled water in order to remove all particles of food. Immediately afterward he again rinsed his mouth with 20 cc. of sterilized water, which was subsequently used to prepare a number of Koch plates. No growth of colonies developed in these plates. The first brushing and rinsing was then omitted, and with the water of the second rinsing a number of plates were again prepared. In the latter each cubic centimeter contained from 435 to 641 colonies. Omitting the first thorough brushing and rinsing, the tissues of the mouth were again brought into contact with 20 cc. of distilled water. After the rinsing, the quantity of water was diluted with an equal volume of a solution containing fresh oil of peppermint

1 cc.; alcohol 10 cc., and distilled water 1000 cc. A number of plates were then inoculated with the following results: Number of colonies obtained from water expelled from the mouth after rinsing and undiluted with antiseptic solution, 544; after two minutes' contact with antiseptic solution, 286; after five minutes, 182; after ten minutes, 95, and after fifteen minutes, 82. Boric acid, potassium chlorate, and sodium benzoate diminished but slightly the number of colonies.

From his long series of experiments Montefusco has concluded that the most satisfactory method of disinfecting the mouth consists in rinsing it, and then brushing the teeth with sterilized brush and water during fifteen minutes. According to this investigator the aromatic essences have practically no germicidal effect upon certain pathogenic bacteria, such as the bacilli of typhoid and cholera; their action being only slightly more effective upon the bacillus diphtheriæ and the diplococcus pneumoniæ.

[*Clinique de Bruxelles,* March 17, 1906.]

SYPHILIS OF THE MAXILLÆ IN ITS RELATION TO DISEASES OF THE DENTAL ORGANS. BY DR. MOUTON.

It is of considerable importance to the practitioner of medicine and that of dentistry, to be thoroughly familiar with the characteristics of syphilitic manifestations in the buccal and facial regions of the maxillæ; as otherwise it is possible to reach such an erroneous diagnosis as to lead to the partial or total resection of the maxillæ. At first, a syphiloma may develop unnoticed; during the period of tumefaction marked edema is present, and the swelling, which is hard if in the palatal or canine region, may simulate a dental abscess or cyst. During the period of ulceration the symptoms are more defined, a cavity being formed which becomes filled with a serous and sanguineous purulent secretion.

The margins of the cavity are ragged, red, and soft; and bleed upon the slightest provocation. Numerous fistulæ often appear leading from necrosed areas—the source of suppuration.

Prior to the ulcerative stage, a correct diagnosis can be reached only by a process of exclusion, and the syphilitic manifestations should not be confounded with sinusitis, cysts, or abscesses. In cases of syphilis of the maxillary sinus, if accompanied by pain that symptom will manifest itself especially at night, but even then will not be very intense, the progress being slower here than in sinusitis of non-syphilitic origin. A differential diagnosis should also be made between its syphilitic manifestations, sarcoma of the arch, and actinomycosis. In sarcoma of the arch the teeth are gradually shed, and the edentulous arch has a deep red and fleshy appearance.

[*Revue de Stomatologie,* Paris, April 1906.]

EXTENSIVE NECROSIS AND SECONDARY FRACTURE OF THE MANDIBLE OF DENTAL ORIGIN. BY DR. J. CHOMPRET.

The essayist reports the case of a man aged twenty-six, of robust constitution, who sought treatment at the stomatologic service of the St. Louis Hospital for a temporo-maxillary trismus of one month's standing. The onset of the disturbance had been accompanied by persistent pain in the right mandibular region. His health prior to the appearance of the pain had been perfect, and his clinical record was free from both personal and hereditary morbid antecedents. As no special tooth was particularly uncomfortable, the patient was induced to submit to treatment only after the development of a series of inflammatory phenomena in the angle of the mandible, which interfered completely with the masticatory movements. He was advised at the hospital to apply hot poultices upon the swollen area, this advice having been given apparently regardless of the cause of the tumefaction. As a result of this treatment, the swelling gradually spread, until it eventually involved the external mandibular tissues as far as the symphysis. Hot applications were continued until, in the opinion of the attending surgeon, the purulent collection had reached a stage suitable for lancing. The incision was made under the angle of the mandible, but it gave vent to a few drops of blood only. More hot applications were applied and a new incision anterior to the first was made, but again to no avail. The pus, however, later on burrowed an outlet through the tissues of the vestibulum oris, and a complete evacuation having taken place, the pain soon diminished. Owing to the highly inflamed condition of the oral tissues—which as above stated had been present for over one month—and the ingestion of the inflammatory products, the general condition of the patient was one of excessive depression and extreme weakness. An intra-oral examination showed that the mucous membrane of the right gingival region was highly congested and edematous, and concealed almost all the teeth. Pus was oozing everywhere from between the teeth and mucous membrane, but the infection seemed to originate particularly from a flap of mucous membrane in the gingivo-buccal groove in the neighborhood of the second molar. The third molar was entirely concealed by congested tissue, the root-canals of the second molar were the seat of profound infection, and the first molar, the two bicuspids, and the canine were so loosely held in their respective alveoli that it was decided to extract them. The same course was likewise pursued in the case of the second and third molars. That part of the mandible which had supported all the affected teeth was completely denuded, bathed in pus, and was in a state of incipient necrosis. It was also noticed that the area supplied by the mental nerve was in a state of anesthesia, a condition showing that the inferior dental nerve had been injured. (Vincent's symptom.)

After the removal of the affected teeth, the patient was directed to use repeatedly antiseptic mouth-washes, to brush his teeth several times a day, and in a word, to endeavor to keep the mouth in as hygienic a condition as possible. A close observation of the above directions soon resulted in an amelioration of all the symptoms, and in the separation of a sequestrum representing a thick layer of osseous tissue from the mandibular angle to the canine region. The separation of the diseased region from the healthy portion was subsequently followed by two spontaneous fractures, one in the canine region and the other near the mandibular angle.

The case under consideration is especially interesting, as it conclusively shows the disastrous consequences of procrastination in the treatment of alveolo-dental abscesses. With regard to the treatment of necrosis the author shares the opinion of the more conservative surgeons that it is always preferable to postpone surgical interference until a plain line of demarkation has been established between the healthy and diseased areas.

[*British Dental Journal*, London, April 14, 1906.]

A CASE OF DENTAL ANKYLOSIS (SYNOSTOSIS). By Joseph Ainsworth Woods.

The author has made an histological examination of a case of dento-alveolar fusion reported by Mr. Frank Harrison at a recent meeting of the North Midland Branch of the British Dental Association. The history of the case was as follows: The patient, a man aged about sixty, consulted Mr. Harrison, requesting the removal of what appeared to be a small loose root which had worked to the surface on the left side of the mandible in the region of the third molar, and was causing slight discomfort, as a denture was worn. The root proved troublesome to remove, but was eventually extracted with the aid of an elevator. The "root" proved to be a rounded bony mass. A year after the removal of the bony mass from the left side, a similar one was removed from the right side. The author has studied the mass removed from the right side, which consisted of the lower two-thirds of the roots of the second or third molar buried in a hard bony tumor, weighing when dry 2.56 gm. and measuring 19 mm. in its antero-posterior diameter and 13 mm. in its linguo-buccal diameter. The surface was very irregular, lobulated in some places and deeply pitted in others, with a pumice-stone appearance on the inferior surface. Foramina could be seen penetrating into the tissues in various directions. The dentin was quite normal, but the granular layer was especially noticeable for the large size and great number of the lacunæ, and for the very distinct connections between them and the dentinal tubules in many places. The pulp-canals showed very little trace of secondary dentin. The cementum was very much thickened, being 2.25 mm. at the apex of the root; the lamellæ were well-marked and could be traced in wavy lines, their general direction being parallel to the outer surface of the dentin. The lacunæ were very abundant but irregular, both in position and in size and shape; in some cases the canaliculi were short and scarcely visible, and in others were very long and branched. Surrounding the cementum and making up the greater bulk of the mass, was a rough form of bone. This was everywhere fused to the cementum, and in many places it would be impossible to exactly draw the line between the two tissues, as no trace could be seen of the alveolo-dental periosteum. There were no regular Haversian systems in the bone, but bloodvessels were numerous, and the cavities irregular in shape and size. Synostosis, according to Hopewell-Smith, who has reported five such cases, is a solid osseous union between the roots of teeth and their alveoli. It has not as yet been clearly explained why in synostosis the coalesced tooth and alveolus should become detached from the main body of the jaw. The alveolar portion of the jaw is quite dependent upon the presence of teeth, and perhaps in these cases the alveolar bone becomes analogous to "bone of attachment," as seen in the reptilia, and therefore is shed with the teeth.

[*La Estomatología,* Madrid, April 1906.]

STOMATITIS. By Ramon Pons.

In this article the author recommends a number of antiseptic mouth-washes which may be found available in the treatment of stomatitis of the ulcerative class, and likewise in the treatment of scattered ulcers or localized inflamed areas.

Antiseptic solutions.

No. 1.

℞—Sodium borate,	gr. xxx;
Thymol,	gr. ij;
Distilled water,	ʒiv.

No. 2.

℞—Benzoic acid,	gr. xij;
Thymol,	gr. ij;
Tincture of eucalyptus,	♏xl;
Water,	ʒviij.

No. 3.

℞—Salicylic acid,	gr. v;
Boric acid,	gr. xxx;
Sodium borate,	gr. x;
Thymolated water, ½:1000	ʒij.

Astringent solutions.

No. 1.

℞—Potassium chlorate,	gr. xxv;
Tincture of cochlearia,	ʒss;
Honey of rose,	℥j;
Decoction of cinchona,	ʒiv.

No. 3.

℞—Potassium chlorate,	gr. l;
Tincture of catechu,	♏x;
Honey,	ʒss;
Boiled water,	ʒv.

Analgesic solutions.

No. 1.

℞—Chloral hydrate,	gr. xx;
Carbolic acid,	gr. x;
Oil of anise,	♏x;
Oil of peppermint,	♏ij;
Boiled water,	ʒviij.

No. 2.

℞—Sodium borate,	gr. xxx;
Boric acid,	gr. lx;
Cocain hydrochlorid,	gr. j;
Boiled water,	ʒiv.

Deodorizing solutions.

No. 1.

℞—Potassium permanganate,	gr. iv;
Distilled water,	ʒviij.

No. 2.

℞—Calcium hypochlorite,	gr. lx;
Honey of rose,	ʒj;
Water,	ʒviij.

[*Deutsche Monatsschrift für Zahnheilkunde,* March 1906.]

ON THE RESECTION OF A PORTION OF THE ROOT IN THE TREATMENT OF CHRONIC ALVEOLAR ABSCESS. By M. A. Masur.

The author is of the opinion that the surgical treatment of an alveolar abscess which consists in the removal of a portion of the apical area of the root is not warranted by the conditions encountered in such cases. The surgical intervention should consist in the removal of all the pathological formations around the end of the root, for they are—in the estimation of the author—the most powerful source of irritation in the chronic class of dento-alveolar abscess. The apical portion of a root when denuded of its periosteum cannot be consistently regarded in the light of the cause of the persistence of the abscess; but even in the event of its being accepted as the source of the continued infection, the operation of root-amputation should prove unsuccessful for the latter, while removing all diseased and necrosed tissues leaves exposed without periosteal cover the sectioned surface of the root.

The author's mode of procedure is as follows: After anesthetizing the field of operation, a vertical incision is made from the fistulous opening in the direction of the apex of the root. With a round bur the alveolus is now perforated and every particle of necrosed alveolar and root tissue is by this means removed. The root is then treated with fifty per cent. sulfuric acid and the wound with a thymol solution. Inside of five days, in all ordinary cases, the wound has completely healed.

[*L'Odontologie*, Paris, April 30, 1906.]

A CASE OF DELAYED ERUPTION. By J. Choquet, Professor at the École Dentaire of Paris.

The patient, a woman forty years of age, of arthritic diathesis, consulted the author regarding a dull pain on the left side of the maxilla, which upon certain occasions would become lancinating in character. The patient wore a small plate supporting the left lateral incisor, the left canine, and several molars of the same side. An examination of the mouth was carefully made, and while nothing abnormal was found in the teeth, a swelling of the mucous membrane in the region of the lateral incisor was plainly visible. In the center of the tumefaction a fistulous opening was present and through it an explorer was introduced. At a short distance from the opening the instrument came into contact with a hard and polished surface, the sensation thus produced being similar to that resulting from the contact of an instrument with an enamel surface. Upon questioning the patient it was ascertained that the left lateral incisor had never erupted. The patient returned a few days afterward complaining that the plate she was wearing at that time on the left side of the maxilla no longer adapted itself to the palate. An examination showed that the impacted lateral incisor was gradually erupting, and the cutting edge of the tooth—which by this time had pierced the mucous membrane—was interfering to a considerable extent with the stability of the plate. As the patient refused to dispense temporarily with the use of the plate, an opening was made in the latter to accommodate the erupting organ.

In the meanwhile the pain persisted, and was as intense as at the beginning of the attack. Dr. Choquet advised the patient to have the offending tooth removed at once, but as the woman declined to have the operation performed when it was first suggested to her, the tooth was not removed until two months later, when the pain and discomfort had become absolutely unbearable. The pain was doubtless caused by the absence of the enamel covering, which, while at the first examination, it was found to be white and polished, had entirely disappeared at the time of the removal of the tooth, which was accomplished with great difficulty under cocain anesthesia. With the exception of the absence of enamel covering, the tooth was otherwise of practically normal shape. The cementum, however, had become greatly hypertrophied. In concluding, the author describes the histological characteristics of the tooth.

◆

PERISCOPE.

A Flask Cleaner.—A lump of washing soda placed in the vulcanizer makes the cleaning of the flask an easy matter.—C. F. Graham, *Dominion Dental Journal.*

To Sterilize Polishing and Grinding Stones.—Brush clean with a plate brush, using soap and water, and dip in a five per cent. solution of formalin in alcohol.—*Dental Register.*

Protection for Facings.—To prevent "etching" of facings when using 20 per cent. platinum solder, paint the surface with a creamy solution of magnesium carbonate before investing.—A. E. Matteson, *Dental Review.*

To Prepare the Floor of the Cap for a Porcelain Crown.—Puncture the floor of the cap from the root side with a pointed three-cornered instrument. A puncture thus made turns up a bur on the porcelain side, which becomes firmly embedded in the body of the piece, and is fully as retentive as a headed pin in the facing.—L. A. ARNOLD, *Dental Review.*

Similarity in Tooth Tissue of Children and Adults.—As I stated years ago, the conditions calling for differences in the treatment of children's teeth and the management of cases in comparison with adult's teeth are due to childhood purely. So far as the tissues of the teeth are concerned we may make fillings in children's teeth just the same as we make them in those of adults, as the tissues of the teeth of the former are hard enough and strong enough.—G. V. BLACK, *Dental Review.*

Disinfectant for Instruments.—A good, cheap disinfectant for your instruments, or for whatever use one may desire to apply it, is found in lysol. It is a pure cresol product, containing the highest percentage of cresylic acid in a soluble and free state. It is a permanent preparation, non-toxic, makes a clear solution in water, is superior to carbolic acid and creolin as a bactericide, and is less poisonous than either. A two per cent. solution is equal to a five per cent. solution of carbolic acid crystals. Lysol is suitable for general disinfection as well as for medicinal uses.—H. E. DAVIS, *Dental Review.*

Square-end Bur in a Narrow Fissure.—The worst thing I know of in the narrow fissure is the round bottom to the cavity as made with a round bur. In such a cavity your gold will roll and twist, and refuse to lie still. No wonder it is difficult. Take a bur with a square end and cut the fissures leaving square angles along the pulpal wall, and you have no need to build up between the cusps. The gold will stay where you put it. It is then comparatively easy to make perfect margins. One of the secrets of bad fillings has been the making of cavities where the gold will roll; but if you make sharp angles in your cavities you ought not to have any difficulty.—G. V. BLACK, *Dental Review.*

To Remove Model from Articulator.—It not infrequently happens that a model is broken in removing it from the articulator. To insure the easy removal of even a very thin model, have three or four sizes of iron plates convenient. These plates are one-twelfth of an inch in thickness, and about the size of the bottom of the model. The plate should have three or four quarter-inch holes in it. In putting a model on the articulator, put the plate on the jaw of the articulator, and the model on the plate with a little soft plaster to hold the plate to the articulator, and the model to the plate. When it is desired to remove the model, slip a knife or chisel between the plate and articulator, and prize the plate and model off together. As the plate is rigid there is no danger of breaking the model. The plate is flasked with the model and recovered after vulcanizing.—C. R. SMITHERS, *Western Dental Journal.*

Cocain and Adrenalin-Cocain Anesthesia.—A long and careful series of experiments by Sikemeier (*Archiv für klin. Chirurgie*, Bd. lxxvii, Heft 2) shows that contrary to some recent teaching, adrenalin, injected with or even before cocain, does not lessen its toxic action. Similar doses with and without adrenalin had the same effect, and the fatal dose was the same also. The effect of the cocain was not at all increased by the addition of adrenalin, and just as much cocain was required if adrenalin was added as without it. The anemia produced by the adrenalin is, however, a great advantage, and it should always be used when hemorrhage is feared. The increase of medullary anesthesia by the addition of adrenalin is due to the anemia of the cord, which in itself produces anemia of the limbs. Zeigon showed that adrenalin alone, injected beneath the dura, produced this effect.—*Therapeutic Gazette.*

Temporary Operation or Gold Filling in Children's Teeth.—If I can secure the proper conditions in the mouth, and if I can so control the patient that I can secure a perfect mechanical operation with gold, without jeopardizing the nervous condition of the child, or creating a dread of dental operations, I will put in gold every time. If, however, I come to the conclusion—after studying the characteristics and temperament of the child—that by attempting to do that kind of work I am creating a dread of operations in that child, I shall put in a temporary filling every time, and shall tell the patient and the patient's parents that it is a temporary operation, and shall set a definite time when that patient is to come back to the office for examination. If by that time I can do permanent work I will do it, and if not, will repeat the temporary operation rather than affect the nervous system of the little child. We are not justified in putting off the permanent operation longer than necessary.—G. V. BLACK, *Dental Review.*

Feeble Sterilizing Influence of Mouth-Washes.—I have taken extracted teeth covered with soft, mushy infection, and dropped them into solutions containing respectively one and three per cent. hydrogen dioxid and twenty-five per cent. glyco-thymoline. At the end of three minutes they were removed with antiseptic precautions, washed in sterilized water, and cultures made on both agar and blood serum slants from bacteria obtained from the film on the tooth. This was done four or five times for each antiseptic. In only one instance did they fail to show a growth at the end of two days. Sometimes the growths were so small and stunted as to require a glass to discover them, but they were always present except in one instance, where three per cent. dioxid was used on a mass for five minutes, giving complete sterility. These tests showed conclusively that while mouth-washes might inhibit growth temporarily, or even occasionally sterilize the deposits, they do not remove the mass of infection. After one per cent. or even three per cent. dioxid has been held in the mouth for from three to five minutes, the viscid bacterial masses around the necks of the teeth will still be present, affording an abundant supply of food for further infection that can continue its pathological work almost as rapidly as though no wash had been used.—JOSEPH HEAD, *Dental Brief.*

Soldering.—A writer in the *Dental Brief* says that a case for soldering should be heated red-hot before applying the blowpipe. This is not at all necessary. Simply heat the case thoroughly over a good gas heater, then place on a carbon soldering block and apply heat at first to the back of investment quite thoroughly, and if it be a case of plate work, bring the blast over the top of the case to the plate—heating that red-hot—and then to the backings, flowing the solder. In bridge work, the heat may be applied directly to the front, after heating as previously directed. In the bridge case a large amount of solder has to be flowed over the backings; while in the plate case only enough solder is used to unite the backings to the plate, and the flow of solder can then be more readily controlled from the top. Heat in any case should never be applied to the investment until the borax and solder have been applied. In all my long experience in soldering I have never found that borax has anything to do with the checking of teeth. In fact that is a thing of rare experience with me. In my early experience before gas was used in the laboratory, the soldering was all done with the mouth blowpipe and an alcohol lamp. In this way full sets of single gum teeth were handled, and later on the carved gum sections. This would be a severe test for the dental student of today.—L. P. HASKELL, *Dentist's Magazine.*

Filling Children's Teeth with Gold.—Why do I fill children's teeth with gold? I do so at present because I have done it for twenty-five years unremittingly and successfully. By successfully I mean much. I mean that practically all the children placed in my care from the outset, whose initial cavities of decay have been filled by me with gold, have rarely suffered the loss of pulps in teeth so filled, and never from decay recurring about those fillings. I should be more explicit here and state that I am especially speaking of the occlusal cavities in first molars. These cavities, properly filled at a very early age with gold, should never need attention again. Any failures that I have had in these six locations have been due to my own faulty work; not to the fact that the teeth were filled with gold. These failures have served the purpose of accentuating the necessity for close observation of all the requirements of the technique. But these failures have been reparable, where the children have been under my exclusive observation, for at the first sign of imperfection along the margins, it has been my practice to remove and refill the tooth without charge. For I am so sanguine that this method need know no failures that I blame only myself when failure occurs. This, by the way, is a good method for the dentist, for since none of us like working gratis, we become more scrupulous with each operation at the initial attempt.—RODRIGUES OTTOLENGUI, *Dental Review.*

Mineral Rather than Oil Stains for Correcting Color in Inlays.—If after the greatest care in the selection and the manipulation of the shades, an inlay is found off color upon removing the matrix, the defect can easily be altered by the use of oil or mineral stains—mineral stains preferred. There being quite a number of the above stains on the market, made by the different manufacturers, it is rather difficult to make a statement that will be fair to all; as each one retains its own peculiarities and advantages. However, speaking from experimental work, the mineral stains made by the S. S. White Co. are made in a porcelain that fuses at a low temperature, and yet will withstand a higher temperature without loss of color. They have little or no tendency toward porosity, even when subjected to quite a high temperature. In one baking they become a part of the inlay and impart the desired tone with a fine enameled surface, which can be partly removed, leaving a surface not as highly glazed, still permanent in the secretion of the mouth, and one that is often desirable. With the oil stain it is different, it being necessary to bake twice: once for the color itself, and a second time for the flux or enamel covering; which, if afterward ground, leaves a rough unfinished surface, and one that is very likely to change in the saliva. One should be careful in selecting these glazes, as there are several that give a very beautiful surface, but after being in the saliva a short time, lose their enameled appearance, and may be scraped off like so much soft tartar. Mineral stains may be used in all branches of porcelain art to advantage in several different ways.—Robert N. LeCron, *Dental Brief.*

Constructing a Crown with a Facing upon a Platinum Base.—For the construction of such a crown, select a high-fusing translucent facing as near the proper shade as possible. If the facing happens to be too light along the cervical margin, and a more yellow color is desired, by grinding the facing very thin at this point and using a dark yellow color for the first baking, the facing may be changed to suit the case in hand. If the crown be an incisor, for the second and probably the last baking use a lighter overlying enamel shade, corresponding with the general appearance of the surrounding teeth. However, if the crown is a bicuspid or molar, it is almost impossible to finish off in two bakings on account of the shrinkage. When the crown has an articulating surface and the facing selected is of the proper shade, use a yellow or brown shade for the first baking, and the same colors again for the second baking; carving the crown the shape and size as desired when finished. After the shrinkage that takes place in this firing, there will remain just enough space for the enamel or last baking. If the surrounding teeth are yellow at the cervical margin, and change suddenly to a blue along the grinding surface, this characteristic blueness of the cusps may be reproduced in the artificial crown by fusing a basal mineral stain upon the second baking at points indicated, and allowing it to show through the enamel coating. This will give a more natural effect than a blueness produced by selecting a blue enamel for the last baking. The translucent blue color often found along the cutting edges of the incisors is produced in a very easy manner by grinding a groove on the lingual side of the facing and filling in with a dark blue shade of porcelain or a basal mineral stain. If the blueness only extends straight across the cutting edge and not down along the approximal walls, the groove should be straight instead of semi-circular.—Robert N. LeCron, *Dental Brief.*

Selecting Shades in Porcelain Inlay Work.—The first essential in selecting shades for an inlay is to study and be able to determine the underlying tones found in the structure of the tooth. For, if one shade be selected that matches perfectly the general appearance of the tooth in which the inlay is to be inserted, one cannot expect a perfect blending of color of inlay to tooth-structure, or even a fair match. Quite to the contrary, if the inlay be a large one, the final result will be an opaque mass, somewhat resembling the appearance of a cement filling, and appearing dark at certain angles under different lights, —the same as a gold filling. If the inlay is small or a thin veneer and a perfect match before cementing, it becomes an opaque mass with all of the above defects as soon as it receives an underlying coating of cement.

With large approximal inlays, not only must the underlying color and the general appearance of the tooth itself be noted, but also the tone or tones of the adjoining tooth or teeth have to be taken into consideration. We generally find—under normal conditions—the underlying colors in the average tooth to be as follows: At the cervical margin, some tone of yellow or brown; central portion, some tone of yellow, gray or blue, and at the cutting edge, some tone of blue or white: these colors properly noted, selected, and packed in the matrix in such a manner—owing to one's having studied the conditions—as to allow one color to show through all or a portion of the other, so that there will be a gradual intermingling of the tones, the underlying effect thus produced resembling the bony structure of the tooth. Over these underlying colors, select for the last baking an enamel color matching the enamel of the tooth or the general appearance. Then, if necessary, the corner may be tipped off with the proper shade of blue or white, as the adjoining teeth may indicate. An inlay made in this manner will be a translucent life-like restoration, blending with the tones of the tooth, and one that will absorb light and have little or no tendency to appear dark after setting. The translucence depends a great deal upon the porcelain selected; generally the higher the fusing, the greater the translucence. If the adjoining teeth be of different tones, and the inlay matches the tooth in which it is placed perfectly, the effect will not be the best; that is, the inlay will be easily detected at first glance. —Robert N. LeCron, *Dental Brief.*

OBITUARY.

DR. JOHN ABNER CHAPPLE.

Died, suddenly, of heart failure, on May 16, 1906, while at luncheon in the Prudential Café, Atlanta, Georgia.

Dr. Chapple was born at Greensboro, Ga., October 23, 1854. He received his early education in the private schools of Athens, Ga., and thereafter studied dentistry with Dr. Lowrance of that city until he went to the Baltimore College of Dental Surgery, from which institution he was graduated in 1872. The same year, after receiving his diploma, he established himself as a practitioner in La Grange, Ga., and in September 12, 1876, was married to Mrs. Annie Wagner Ware of La Grange. He moved from La Grange to Atlanta in 1891, and there continued in active practice until his death.

Dr. Chapple is survived by his widow, one daughter, and one son.

Dr. Chapple was an exceptional character, one of those rare personalities to whom men were instinctively drawn by the sympathetic quality which radiated from his presence. His greeting inspired a trustfulness which deepened upon fuller acquaintance, and few men with equal opportunities could claim a larger circle of warm friends. Positive in his convictions, fearless in the expression of his opinions, he yet had that sensitive regard for the feelings of his fellow men that tempered all of his statements with kindliness, so that his criticisms never wounded. His social gifts made him always the welcome guest, and all who knew him will cherish the memory of his delightful qualities as an entertainer of his friends, whether in small informal groups or in the more formal professional functions in which he took active part.

When the National Dental Association agreed to hold its coming meeting in Atlanta, the almost immediate and spontaneous expression of the membership was that Dr. Chapple should be made chairman of the local committee of arrangements. The appointment was a tribute to his abilities and genial character as a host. This work he had entered upon with his characteristic enthusiasm, and had it fully planned at the time of his unexpected call to other and higher fields of action.

In his professional work he stood among those in its front ranks, and though he had decided views as to methods of practice, he was prompt to acknowledge and adopt that which made for advancement. He had devoted much study to the pathology of gingival disorders and their treatment, so that his practice was largely specialized in that class of cases. He was not content to deal with his cases empirically, but constantly sought to solve their deeper problems of cause and effect, and to modify his practice in accordance with the newer light which his studies developed. As he was a student, so also was he a teacher—not only in the special relation which he bore to the Atlanta Dental College as a member of its faculty, but in that broader sense which made him a guide and honored leader in the professional associations in which he took an active interest. His words in dental society meetings always commanded respectful attention for the helpful teaching quality of the thought that they conveyed to his hearers. His address and manner were always those of a polished gentleman. One of his many lovable attributes found expression in a custom which showed the tender and sentimental side of his nature. For years he never went to his office without a flower either in his hand or pinned on his coat—a loving daily attention upon the part of his wife never omitted.

His love for his profession was beyond the influence of personality or partisanship and his loyalty to the cause of professional advancement was unfailing. No better evidence of the breadth of his generous and loyal character can be furnished than the following letter, addressed to his friend Prof. B. Holly Smith on the occasion of the reunion on May 10th of the Alumni of the Baltimore College of Dental Surgery:

PRUDENTIAL BLDG., ATLANTA, GA.,
May 4, 1906.

My dear Dr. Smith,—Please make it clear to the Alumni Association that my failure to be present with them is wholly due to causes which I previously stated to you both by letter and in person; and with the additional reason that ten months ago I consented to read a paper before the Alabama Society, which meets on May 10th.

It is indeed a great disappointment to me not to be able to participate in what is destined to prove the most important meeting ever held by the Alumni of the B. C. D. S.

The time has come when we must cease to hang upon the apron-strings of our alma mater and point the finger of pride to her motherly care and training. She has reached a period in her sublime career when we must go to her rescue, and place at her disposal means by which she can achieve even greater usefulness and glory.

To that end I beg the rare privilege of subscribing one hundred dollars, to go to a fund to be disposed of in the discretion of the trustees. Are there not two hundred alumni who will give a similar amount?

With affectionate regards,
Your fellow alumnus,
J. A. CHAPPLE.

We can find no better words in which to express our appreciation of the spirit exemplified in this generous act than those of the recipient of the letter. Dr. Smith says: "In this day, when in many sections of our country competition is rife, when men representing schools are eagerly seeking to swell the student list of their colleges, for a teacher in the Atlanta school to pledge a hundred dollars and good wishes to his alma mater, and in some sense a rival of his own school, shows a spirit a little ahead of his time which is a worthy example. Especially is this so because those who arranged for the meeting never contemplated such a thing and the suggestion was purely voluntary on Dr. Chapple's part."

A worthy example indeed, and a fitting tribute to a dental educational institution which, like the others that are earnestly and honestly working for the good of their students, gives them something not set forth in the curriculum, not paid for in tuition fees, but of greater value and importance perhaps than a technical profession—namely, the shaping and impulse toward a noble character, a true professional manhood. How few there are who signalize their gratitude for this by such an act as Dr. Chapple's, and how many there are who ought to.

The dentists of Georgia particularly, and his friends generally throughout the whole country, will find it hard to fill the vacancy caused by his death. The students of the college where for so long he has been a teacher will mourn his departure, for they have lost a friend whose guidance has meant much to them in the college days and in the battle of professional life thereafter. And there is that other and inner circle of his friends to whom his loss brings the kind of sadness which, though it is deeper and keener, is yet tempered by the benediction which his lovable personality bestowed upon them, to whom he always was and always will be, "Dear old Chapple—God bless him!"

The following letter of condolence was sent to the family by the Atlanta Dental College alumni residing in Augusta:

AUGUSTA, GA., May 17, 1906.

To the family of Dr. John A. Chapple:

We have just learned that Dr. Chapple has gone.

How sad these words are to us! No student has profited by his able teaching who has not gone home with the most profound admiration and love for Dr. Chapple. None knew him but to love him. In his death we know that the whole dental fraternity has suffered a blow from which it will not easily recover, but we will try to console ourselves when we realize that our profession is nobler, our aspirations higher, our learning nearer perfection, and our determination to live upright lives more impressed upon us, by his life having touched ours.

To his family and friends we extend our most sincere sympathy.

(Signed) WALTER C. MILLER, Class 1900
GEO. M. WOODBURY, " "
R. H. CALHOUN, " 1904.
JAMES A. DOBEY, " 1905.
L. G. YOUMANS, " "
J. T. WHITLAW, " "

DENTAL COLLEGE COMMENCEMENTS.

ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

The annual commencement exercises of the Royal College of Dental Surgeons of Ontario were held in Toronto, Ont., April 27, 1906.

An address to the graduates was delivered by Prof. T. B. Kilpatrick, D. D.

The degree of Licentiate of Dental Surgery was conferred by Dr. H. R. Abbot, president of the board of directors, on the following graduates:

Frederick Albert Axon
Herbert Wesley Baker
John Archibald Beatty
Frederick Chas. Becker
John Alexander Bothwell
Sydney Wood Bradley
Ernest Edwin Bruce
Nelson Stanley Coyne
John William Clay
Morley Ash Day
James Martin Deans
Wm. Harry Doherty
Alex. Smith Elliot
Marvin Arnold Fallis
Felix Andrew French
Wm. Howard Geddes
William Ryerson Glover
Margaret Donald Gordon
Geo. Maxwell Gorrel
Edmund Alexander Grant
John T. Hackett
Fred. Little Heath
Emery Coe Jones
Alex. Robertson Jordon
Ernest Kelly
Albert Victor Lester
Bradley Wills Linscott
Daniel Webster Massey
Joseph Edward Middleton
Charlton Arthur Mills
Robert McGill
Herbert A. McKim
Gordon Balgarnie New
William Joseph Price
Clare Prichard
Howard Matthew Reid
William Henry Reid
George Fulton Roulston
George Darling Smith
Lewis Thomas Gerald Smith
Wallace Clendon Smith
Ernest Bland Sparks
Arthur Rudolph Stapells
Chas. Bowen Stover
Garnet Beverley Tovell
Harold Linton Watt
Ernest Albert Wessels
Wm. Frederick Ghent Wilson
Edwin Herbert Wilson

OHIO COLLEGE OF DENTAL SURGERY.

The sixtieth annual commencement exercises of the Ohio College of Dental Surgery were held at the Odeon, Cincinnati, May 10, 1906.

Addresses were delivered by Rev. George A. Thayer and John C. McKee.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

William F. Baber	West Virginia
Guy P. Bannister	Kentucky
Earl Frank Bohn	Kentucky
Frank Bryan	Texas
Alexander J. Clark	Canada
James B. Collins	Ohio
Harry M. Cormany	Ohio
Charles Cornish, Jr.	Mexico
William L. Cottle	West Virginia
Alexander Crawford	Canada
Clifford E. Deardorf	California
Garland J. Eisman	West Virginia
Victor W. Emanuel	North Dakota
Bert W. Fesler	Indian Territory
H. Roy Garst	Ohio
J. Ray Garst	Ohio
Ira Hook	Ohio
Ward Kidd	West Virginia
John C. McKee	Kentucky
Homer Mammon	West Virginia
Frederick C. Nerish	Ohio
Harrison Shumate	Ohio
Robert Shumate	West Virginia
Roscoe C. Stamper	Kentucky
Frederick S. Stilwell	Ohio
Henry G. Swertfager	New York
Edward B. Williams	New York
Clarence V. Yaple	Ohio
Samuel N. Young	Ohio

BALTIMORE COLLEGE OF DENTAL SURGERY.

THE sixty-sixth annual commencement exercises of the Baltimore College of Dental Surgery were held in Albaugh's Theater, Baltimore, Friday, May 11, 1906, at 8 P.M.

The annual oration was delivered by Col. John H. Alexander, and the valedictory by F. P. Duffy.

The degree of Doctor of Dental Surgery was conferred by the dean, Prof. M. W. Foster, on the following graduates:

G. C. Baker	West Virginia
J. U. Baker	West Virginia
J. W. Birdsell	Vermont
F. A. Boucher	Connecticut
E. de Caturla	Cuba
D. S. Cleveland	Canada
W. K. Conrad	New Jersey
L. J. Cord	New York
C. H. Craig	Canada
A. P. Crist	Maryland
A. C. Cupp	Pennsylvania
G. R. Dobson	Canada
F. P. Duffy	Rhode Island
C. D. Eppreght	Texas
C. Ferrill	Mississippi
C. B. Fogarty	Florida
A. B. Gale	Connecticut
L. R. Gorham	North Carolina
N. B. Gwynn	Maryland
A. L. Harvin	South Carolina
J. L. Hennessey	Massachusetts
E. J. Hinson	South Carolina
C. E. Killary	Vermont
W. C. Killinger	Virginia
R. H. Kramer	Connecticut
M. Martinez	Cuba
A. L. McKenzie	Canada
J. W. Millsops	Mississippi
O. Monagas	Cuba
J. A. O'Conner	Georgia
A. S. Palmer	Pr. Edw. Islands
P. de G. Pickett	Louisiana
L. C. Polk	Texas
O. C. Post	West Virginia
E. L. Rich	Georgia
J. T. Roach	Canada
A. E. Rogers	Connecticut
A. F. Schlappi	New York
A. C. Seids	Oklahoma Terr'y
W. R. Stevens	Maryland
W. B. Sullivan	Georgia
W. B. Swinski	Maryland
R. H. Thompson	Maine
F. Travieso	Porto Rico
J. M. Whettling	New York

CINCINNATI COLLEGE OF DENTAL SURGERY.

THE thirteenth annual commencement exercises of the Cincinnati College of Dental Surgery (Dental Department of Ohio University) were held on Thursday, May 3, 1906, at Sinton Hall, Y. M. C. A., Cincinnati.

The valedictory address was delivered by Rev. Chas. F. Goss.

The degree of Doctor of Dental Surgery was conferred by Hon. H. L. Gordon, president of the board of trustees, on the following graduates:

Harry P. Butler	Kentucky
John L. Carithers	Ohio
Morris Gruenebaum	Germany
Roy Hendricks	Ohio
Harry C. Mensing	Ohio
Ancel C. Minor	Ohio
Ira A. Smith	Pennsylvania

UNIVERSITY OF MARYLAND, DEPARTMENT OF DENTAL SURGERY.

THE annual commencement exercises of the Department of Dental Surgery of the University of Maryland were held in Chase's Lyceum Theater, Baltimore, Md., May 9, 1906.

An address to the graduates was delivered by Hon. Edwin Warfield, Governor of Maryland, and the class oration was delivered by Henry Strasser.

The degree of Doctor of Dental Surgery was conferred by Bernard Carter, Esq., provost, on the following graduates:

Heman Roy Allen	Vermont
Robert H. Banks	Virginia
B. Cecil Burgess	Connecticut
G. Alvin Burton	Delaware
Clifton S. Coffman	West Virginia
Daniel C. Colvin	Pennsylvania
Warren S. P. Combs	Delaware
Moses C. Copelan	Virginia
Arthur Almon Dill	Nova Scotia
Ernest Garner Douglas	New York
James B. Early	Virginia
George Walter Frank	Massachusetts
Peter H. A. Flood	New Hampshire
Charles Philip Freischlag	New York
Peter A. Garneau	Massachusetts
Chester Brownell Gifford	New York
James Keirl Gilder, Jr.	South Carolina
Eugene S. Greene, Jr.	Virginia
Ivey Lee Hawes	North Carolina
George Howard Hiney	Connecticut
Raymond L. Hughes	Maryland
Ernest Beard Hutchins	Virginia
Frank P. Kehoe	Georgia
J. Milton King	Connecticut
George Stephen Leslie	New York
Westley Audrey Long	Florida
James Raine Meador	North Carolina
Thomas Francis Mullen	New Hampshire
Walter D. Myers	Virginia
Edwin Clare Neckerman	Pennsylvania
Daniel Worth Parrott	North Carolina
Louis H. Rothenberg	New York
Abraham Rothman	Maryland
William Robert Ryder	Jamaica, B.W. I.
Leicester D. Samuel	Jamaica, B.W. I.
John Levis Sanders	South Carolina
Le Roy Sigler	Maryland
Erastus P. Skaggs	West Virginia
Henry Strasser	Maryland
William C. Van Meter	West Virginia
George Earle Weeks	North Carolina
Arthur B. Wheeler	Maryland

LINCOLN DENTAL COLLEGE.

THE annual commencement exercises of the Lincoln Dental College (University of Nebraska) were held May 12, 1906, at Lincoln, Neb.

The doctorate address was delivered by Edward G. Maggi.

The degree of Doctor of Dental Surgery was conferred by Dr. W. Clyde Davis, dean, on the following graduates:

Paul Selby Anderson
Thomas LeVerne Bradshaw
Charles Blaine Branson
Ralph D. Conkling
Jason Watson Dorwart
Elbert Wesley Fellers
William Allen McHenry

WESTERN DENTAL COLLEGE.

THE sixteenth annual commencement exercises of Western Dental College were held at Kansas City, Mo., Tuesday, May 8, 1906.

The annual address was delivered by H. M. Beardsley.

The degree of Doctor of Dental Surgery was conferred by the dean, D. J. McMillen, M.D., D.D.S., on the following graduates:

W. Joseph Armstrong
M. V. Baker
R. G. Boutin
A. H. Braden
E. H. Browning
J. R. Clark
C. E. Douglass
H. A. Duensing
G. E. Eubank
Clyde Fahring
Mannie H. Fewell
L. H. Goodrich
Earl Hamel
S. M. Haught
Thew J. Ice
C. M. Jackson
Louis C. Krause
W. V. Lane
E. T. Lay
Paul McDonald
Albert E. Martin
Alford Mathews
Will Mather
H. H. Ott
J. Will Ott
N. H. Peebles
J. D. Ratliff
F. G. Ratcliffe
Mabel Reynolds
R. K. Richter
Elmer E. Rosser
V. B. Shaw
Vernon A. Shoop
Richland B. Slayton
M. Sweet
J. Albert Taylor
Carlisle Taylor
Earl Trunnell
Alonzo Wiley

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS: June, July, and August, 1906.

JUNE.

AMERICAN MEDICAL ASSOCIATION—SECTION ON STOMATOLOGY. Boston, Mass. Four days: June 5th to 8th.

DISTRICT OF COLUMBIA DENTAL SOCIETY AND MARYLAND STATE DENTAL ASSOCIATION. Washington, D. C. Three days: June 7th to 9th.

GEORGIA STATE DENTAL SOCIETY. Savannah. Three days: June 19th to 21st.

INDIANA STATE DENTAL ASSOCIATION. West Baden and French Lick Springs. Three days: June 26th to 28th.

IOWA E. K. WEDELSTAEDT CLUB. Clear Lake. Two days: June 25th and 26th.

KENTUCKY STATE DENTAL ASSOCIATION. Louisville. Three days: June 12th to 14th.

LOUISIANA STATE DENTAL SOCIETY. New Orleans. Two days: June 1st and 2d.

MASSACHUSETTS DENTAL SOCIETY. Boston. Four days: June 5th to 8th.

MINNESOTA STATE DENTAL ASSOCIATION. Minneapolis. Three days: June 11th to 13th.

MISSISSIPPI DENTAL ASSOCIATION. Gulfport. Three days: June 6th to 8th.

MISSOURI STATE DENTAL ASSOCIATION. Springfield. Three days: June 5th to 7th.

NORTH CAROLINA DENTAL SOCIETY. High Point. Four days: June 20th to 23d.

PENNSYLVANIA STATE DENTAL SOCIETY. Philadelphia. Three days: June 26th to 28th.

SOUTH CAROLINA STATE DENTAL ASSOCIATION. Charleston. Four days: June 26th to 29th.

SOUTH DAKOTA STATE DENTAL SOCIETY. Vermilion. Three days: June 12th to 14th.

TEXAS STATE DENTAL ASSOCIATION. Galveston. Three days: June 14th to 16th.

JULY.

MAINE DENTAL SOCIETY. Moosehead Lake. Three days: July 17th to 19th.

MICHIGAN STATE DENTAL ASSOCIATION. Detroit. Three days: July 9th to 11th.

NEW JERSEY STATE DENTAL SOCIETY. Asbury Park. Four days: July 18th to 21st.

WISCONSIN STATE DENTAL SOCIETY. Madison. Three days: July 17th to 19th.

AUGUST.

AMERICAN DENTAL SOCIETY OF EUROPE. Berlin, Ger. Four days: August 1st to 4th.

CENTRAL-VEREIN DEUTSCHER ZAHNÄRZTE. Dresden, Saxony. Three days: August 4th to 6th.

INTERNATIONAL DENTAL FEDERATION. Geneva, Switzerland. Two days: August 8th and 9th.

Examiners' Meetings.

ARIZONA BOARD OF EXAMINERS. Tucson. July 2d to 4th.

CONNECTICUT DENTAL COMMISSIONERS. Hartford. June 27th to 29th.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS. Washington, D. C. July 5th to 7th.

IDAHO BOARD OF DENTAL EXAMINERS. Boisé City. June 13th to 15th.

ILLINOIS BOARD OF DENTAL EXAMINERS. Chicago. June 4th.

INDIANA BOARD OF DENTAL EXAMINERS. Indianapolis. June 12th.

IOWA BOARD OF EXAMINERS. Iowa City. June 14th.

KENTUCKY BOARD OF DENTAL EXAMINERS. Louisville. June 5th.

MASSACHUSETTS BOARD OF REGISTRATION. Boston. June 27th to 29th.

MINNESOTA BOARD OF EXAMINERS. Minneapolis. June 14th to 16th.

MONTANA BOARD OF EXAMINERS. Helena. July 16th to 18th.

NEW HAMPSHIRE BOARD OF REGISTRATION. Manchester. June 13th to 15th.

NEW JERSEY BOARD OF DENTAL EXAMINERS. Trenton. July 9th to 13th.

NORTH CAROLINA BOARD OF EXAMINERS. High Point. June 18th to 20th.

OHIO BOARD OF DENTAL EXAMINERS. Columbus. June 26th to 28th.

PENNSYLVANIA BOARD OF EXAMINERS. Philadelphia and Pittsburg. June 5th to 8th.

RHODE ISLAND BOARD OF REGISTRATION. Providence. July 10th to 12th.

SOUTH CAROLINA BOARD OF EXAMINERS. Isle of Palms. June 22d.

SOUTH DAKOTA BOARD OF EXAMINERS. Sioux Falls. July 31st to August 2d.

VERMONT BOARD OF DENTAL EXAMINERS. Montpelier. July 10th to 12th.

VIRGINIA BOARD OF EXAMINERS. Richmond. June 12th.

WEST VIRGINIA BOARD OF EXAMINERS. Charleston. June 6th to 8th.

WISCONSIN BOARD OF EXAMINERS. Milwaukee. June 18th.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

General Meeting to be held in Geneva, August 8 and 9, 1906.

PRELIMINARY NOTICE.

THE next annual meeting of the Fédération Dentaire Internationale will be held in Geneva, Switzerland, August 8 and 9, 1906. By direction of Dr. W. D. Miller, its president, and upon the authority of the Executive Council, the meeting will be a general one, at which all members of the F. D. I. and those eligible for membership who may be interested in the work and purposes of the Federation are invited to be present.

The meeting will be inaugurated by an open general session at which the address of the President, together with the reports of the several officers, will be read and discussed; at which time also the detailed program of the succeeding sessions will be announced.

The work of the several commissions already established by the F. D. I. will be reported upon and elaborated in meetings following the general opening session.

The Commission of Education will report upon the progress of its work toward perfecting a curriculum of studies to be recommended for adoption in the dental educational institutions of the various countries, and seek to establish means for the regular interchange of reports among the schools upon this important question.

The Commission on Hygiene will report upon the question of dental hygiene in relation to the public service, and particularly upon the promotion of systematic dental service in the armies and navies of the world.

The Commission on International Dental Press will consider the means for establishing an International Dental Review, so as to bring into closer relation the records of dental science and art, as well as of professional progress among the several countries of the world.

The Commission on Dental Jurisprudence and the Commission on Dental History will present for consideration the plans which in each case have been prepared for the prosecution of their work.

The various suggestions brought out in the discussions of the commissions will be further considered and finally acted upon at the general session with which the meeting will close.

Papers upon the various important topics which comprise the work of the Federation will be read before the meetings of the commission to which they directly relate.

The Geneva meeting promises to be the most important reunion which has been held, and its results will exert a far-reaching influence upon the progress of dentistry for the coming year at least. The social side of the meeting is already an assured success. The attractions of Switzerland are too well known to need favorable comment. Our colleagues of the little sister republic are exerting every effort to create a new standard of hospitality in the entertainment of F. D. I. delegates, so that as a combination of vacation recreation and professional social intercourse, with the opportunity to take part in a most important movement for the uplifting of our profession both in an international and national way, the Geneva meeting affords a rare opportunity. Let everyone who can do so contribute by his presence to the success of this great meeting.

Provisional Program.

OPENING SESSION.

(1) President's address.

(2) Report of the secretary-general.

(3) Report of the treasurer and appointment of auditors.

(4) Election of members of the *International Commission on Nomenclature.* (Chairman, Dr. John Grevers, Amsterdam.)

(5) Election of members of the *International Commission on Jurisprudence and Professional Ethics.*

(6) Motion by a member to hold biennial or triennial meetings only.

(7) Discussion as to what shall be the plan of work of the F. D. I. in the immediate future.

MEETINGS OF COMMISSIONS.

1. *Commission of Education.* (Chairman, Dr. Truman W. Brophy, Chicago.)

  (1) Motion by the French National Committee: Adoption of a definite plan of work for the commission, and study of the best means to be employed in order to bring about the establishment of regular relations between reputable dental colleges of different countries.

  (2) Motion by Dr. Arkövy: Dentistry (stomatology) is a branch of general medicine and belongs to the structure of medical science and medical education.

  (3) Motion by Angelo Chiavaro, Rome: Physicians intending to pursue dental courses at dental schools must pledge themselves to continue such studies long enough to acquire a sufficient degree of skill and knowledge of the practical branches of dentistry to enable them to practice dentistry in a manner creditable to the profession.

II. *Commission of Hygiene and Public Dental Service.* (Chairman, Dr. L. C. Bryan, Basle, Switzerland.)

  (1) Discussion on the advisability of publishing a booklet on dental hygiene.

  (2) Motion by Dr. Bryan: (a) How are we to reach, interest, and educate the public in dental hygiene? (b) How shall the school children be treated to assure the development of a useful dentition through life? (c) How shall the needy public be treated?

III. *Commission on Military and Naval Dental Service.* (Chairman, Dr. Williams Donnally, Washington, D. C.)

IV. *International Commission on the Dental Press.* (Chairman, Dr. A. W. Harlan, New York.)

  Study of the means to be employed to bring about the creation of an international dental organ, and to establish closer relations between the professional journals of different countries.

V. *Commission on Jurisprudence and Professional Ethics.* (Chairman, Dr. Wm. Carr, New York.)

VI. *Commission on History of Dentistry.* (Chairman, Dr. Charles McManus, Hartford, Conn.)

VII. *Commission on Dental Nomenclature.* (Chairman, Dr. John Grevers, Amsterdam.)

VIII. *Commission on the definition of What Shall Constitute a National Committee.* Drs. Harlan, Wm. Guye, and E. Sauvez.

IX. *Commission on the Means to be Employed to Furnish the Poorer Classes with a Cheap Tooth-brush.* (Chairman, Dr. Haderup, Copenhagen.)

CLOSING SESSION.

(1) Report of auditors and consideration of treasurer's report.

(2) Reports of the various commissions and vote of resolutions.

(3) Designation of date and place of next meeting.

(4) Individual motions.

EDWARD C. KIRK, *Secretary-general.*

CENTRAL-VEREIN DEUTSCHER ZAHNÄRZTE.

THE next annual meeting of the Central-Verein Deutscher Zahnärzte will be held at Dresden (Saxony) August 4 to 6, 1906, immediately following the meeting of the American Dental Society of Europe in Berlin, and preceding that of the Fédération Dentaire Internationale, which takes place at Geneva on the 8th and 9th of August. Members of the profession in America who took part in the meeting of the C. V. D. Z. at Hanover know that they will be sure of a hearty welcome, and I hereby cordially invite as many of them as intend visiting Europe during the coming summer to arrange their plans so as to meet with us in Dresden at the above-mentioned date.

W. D. MILLER, *President.*

NATIONAL DENTAL ASSOCIATION.

Tenth Annual Session.

The tenth annual session of the National Dental Association will be held in Atlanta, Ga., commencing Tuesday, September 18, 1906.

The new Kimball House has been selected by the local committee of arrangements as headquarters, where all general sessions of the association and of the sections will be held. The rates per day at the New Kimball House will be—European plan, from $1.50 to $4.00; American plan, from $3.00 to $6.00, governed by choice of rooms.

The usual railroad rate of one and one-third fare for the round trip, certificate plan, will be arranged for, and definite dates and particulars given later by Dr. J. D. Patterson, chairman of the Executive Committee.

The general officers and those of the sections, as well as the committee chairmen and their members, have been working hard to provide an interesting and instructive program, and a large attendance is expected.

Section I.

This section presents the following program of papers for consideration: "The Present Status of Porcelain Inlays," John Quincy Byram, Indianapolis, Ind.; "Orthodontia," Richard Summa, St. Louis, Mo.; "A Phase of Art in Prosthesis," George H. Wilson, Cleveland, Ohio; "Porcelain," C. N. Thompson, Chicago, Ill.; "Setting Crowns and Bridges with Gutta-Percha," L. G. Noel, Nashville, Tenn.; "Orthodontia," Victor H. Jackson, New York city; "Orthodontia," Calvin S. Case, Chicago, Ill.; "The Inevitable Outcome of Crown and Bridge Work," E. Parmly Brown, New York city; "General Practice," W. Leon Ellerbeck, Salt Lake City, Utah.

B. L. Thorpe, *Ch'm.*, St. Louis,
D. O. M. Le Cron, *Sec'y*,
St. Louis, Mo.

Section II.

This section presents the following program of papers for consideration: "Manual Training an Essential to Dental Education," Burton Lee Thorpe, St. Louis, Mo. Subjects not given: George S. Vann, Gadsden, Ala., and Clarence J. Grieves, Baltimore, Md. "Prosthetic Nomenclature," Geo. H. Wilson, Cleveland, Ohio; "The Nomenclature of Materia Medica and Therapeutics," A. H. Peck, Chicago, Ill.; "Operative Dentistry," H. H. Johnson, Macon, Ga.

Howard E. Roberts, *Ch'm.*, Phila., Pa.
C. S. Butler, *Sec'y*, Buffalo, N. Y.

In one of the general sessions, Chas. McManus, Hartford, Conn., chairman Committee on History, will present an illustrated paper on "The Remarkable History of the Profession and the Splendid Character of the Men of the Past Who Helped to Build It Up," and A. W. Harlan, New York city, will present a paper on "The Blue Light and Heat as Therapeutic Agents."

The Committee on Oral Hygiene promise an interesting summary of their work, illustrated methods of teaching the science to both dentists and layman, essays, resolutions, and the report of the committee.

J. P. Corley, *Ch'm.*, Greensboro, Ala.
F. W. Stiff, *Sec'y*, Richmond, Va.

Clinics.

We are promised a large and interesting list of clinics, which will be held in one of the local dental college buildings. Announcement of the list and where they will be given will appear later.

Thomas P. Hinman, *Ch'm.*, Atlanta, Ga.
C. L. Alexander, *Sec'y*, Charlotte, N. C.

An N. D. A. Dental Journal.

It is earnestly desired that there shall be a large attendance of members and delegates, so that the committee appointed to devise ways and means to own and control a dental journal may feel encouraged to launch such a scheme as will at once meet the approval and hearty support of the association, which now has members enough to guarantee the project.

Many other features for a new era of success in the National Dental Association can be mapped out at the Atlanta meeting, if only we have a sufficiently large and enthusiastic gathering of the members of the profession to make it appear worth while.

M. F. Finley, *President*,
Washington, D. C.

AMERICAN MEDICAL ASSOCIATION—SECTION ON STOMATOLOGY AND THE MASSACHUSETTS STATE DENTAL SOCIETY.

THE next meeting of the American Medical Association will be held in Boston, Mass., June 5 to 8, 1906.

Those wishing to join the American Medical Association, Section on Stomatology, may do so by writing to the secretary for blank to be filled out and signed by the present president and secretary of their state or local dental society. Inclose this with five dollars ($5.00), and send to the secretary of the Section on Stomatology.

The Massachusetts State Dental Society will hold a joint meeting with the Section on Stomatology.

H. O. CARLTON, *Chairman.*
EUGENE S. TALBOT, *Sec'y,*
Chicago, Ill.

PROGRAM—SECTION ON STOMATOLOGY.

1. Chairman's Address. H. P. Carlton, San Francisco.

2. "The Structure of the Jaws of the Lower Vertebrates." J. S. Kingsley, Boston, Mass.

3. "Development of the Human Jaw." Chas. L. Minot, Chicago.

4. "Palates of the Feeble-minded." Walter Channing, Brookline, Mass.

5. "The Reflexes of Dentition from the Physician's Standpoint." Chas. Hunter Dunn, Boston, Mass. Discussion opened by Thos. Morgan Rotch, Boston, and A. C. Cotton, Chicago.

6. "Gingival Manifestations of Metabolic Disorders." Alfred C. Croftan, Chicago.

7. "Interstitial Gingivitis Produced by Auto-intoxication as Indicated by the Urine and Blood Pressure." E. S. Talbot, Chicago.

8. "Treatment of Loosened Teeth." M. L. Rhein, New York city.

9. "Conservatism in the Treatment of Infants with Hare-lip and Cleft Palate." G. V. I. Brown, Milwaukee, Wis.

10. "Conservative Surgery of the Lip." Thos. Fillebrown, Boston.

11. "The Prevention of Disfiguring Scars About the Face." M. I. Schamberg, Philadelphia.

12. "Some Pathologic Features of the Pulp." V. A. Latham, Chicago.

13. "The Relation of Systemic Diseases to the Conditions of the Oral Cavity." James E. Power, Providence.

14. "Medical Phases of Dental Disorders." Samuel A. Hopkins, Boston.

15. "The Botanical Diagnosis of Leptothrix Racemosa and Its Relations to the Modern Doctrine of Bacteriology." Filandro Vicentini, Chieti, Italy.

16. "Practical Innervation of the Trifacial Nerve." M. H. Fletcher, Cincinnati, Ohio.

17. "Practical Ethics." George F. Eames, Boston.

18. "Two Cases of Infantile Scurvy." Alice M. Steeves, Boston.

PROGRAM—MASSACHUSETTS SOCIETY.

"Clinical Pathologic Studies of Asymmetrical, Facial, Maxillary and Dental Development," G. V. I. Brown, Milwaukee, Wis.

"Some of the Factors that Modify Jaws and Other Parts of the Face," M. H. Cryer, Philadelphia, Pa.

(Subject to be announced), Vida A. Latham, Chicago, Ill.

"This the Land of Unlimited Opportunity for All, and the Duty of the Dentist in These Days of Doubt," James C. Monaghan, Washington, D. C.

"The Necessity for an Endowment of Dental Schools," Wm. H. Potter, Boston, Mass.

"Cysts of the Jaws," Murdoch C. Smith, Lynn, Mass.

"Dental Education," Eugene S. Talbot, Chicago, Ill.

"The Need of an Independent Journal in the Dental Profession," Herbert L. Wheeler, New York, N. Y.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE twenty-fourth annual meeting of the National Association of Dental Examiners will be held at the New Kimball House, Atlanta, Ga., September 14th to 17th, commencing 10 A.M., Friday, September 14, 1906.

The rates per day will be, European plan, from $1.50 to $4.00, American plan, from $3.00 to $6.00, governed by choice of rooms.

The convention hall is in the hotel, and every effort will be made by the proprietors for the care and comfort of the members.

Arrangements are being perfected for those desiring a short ocean trip at reduced rates, via the Clyde and Old Dominion steamship lines, notice of which will be given by circular later.

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

NATIONAL ASSOCIATION OF DENTAL FACULTIES

THE annual meeting of the National Association of Dental Faculties will be held in Atlanta, Ga., commencing at 2 P.M., Friday, September 14, 1906. The executive committee will meet at 10 A.M. on the same day.

H. B. TILESTON, *Ch'man Ex. Committee*,
R. M. SANGER, *Sec'y Ex. Committee*,
East Orange, N. J.

CANADIAN DENTAL ASSOCIATION.

THE Canadian Dental Association will hold its third bi-annual meeting in Montreal, Quebec, September 5 to 8, 1906.

C. F. MORRISON, *Sec'y*,
Montreal, Can.

AMERICAN DENTAL SOCIETY OF EUROPE.

THE next meeting of the American Dental Society of Europe will be held at Berlin, Germany, August 1, 2, 3, and 4, 1906. A most cordial invitation is extended to members of the profession to be present.

An interesting program is already assured, and it is hoped to make this one of the most interesting and largely attended meetings in the history of the society.

GEO. O. WEBSTER, *Hon. Sec'y*,
Pariser Platz I, Berlin, Germany.

ALAMEDA COUNTY DENTAL SOCIETY.

THE Alameda County Dental Society at its last meeting unanimously adopted the following resolutions:

Whereas, By the recent calamitous fire in San Francisco many practicing dentists of that city have lost their office equipment, thus depriving them of the means of earning a livelihood; therefore be it

RESOLVED, That we, the members of the Alameda County Dental Society, extend to them our sympathy, and hereby tender the use of our offices without charge to those worthy practitioners from the stricken city who wish to avail themselves of such temporary use; be it further

RESOLVED, That in the event of any of their patients coming to us for treatment, we prescribe for them with the understanding in the beginning that as soon as their dentist is equipped for practice they shall return to him, and that we will not accept them as permanent patients; also be it

RESOLVED, That a copy of these resolutions be spread upon the minutes of the society, and that a copy be sent to each of our fellow practitioners in San Francisco; and be it further

RESOLVED, That our sympathy and assistance be extended to those members of the dental profession who have suffered in San José, Santa Rosa, and other towns.

J. L. PEASE,
J. C. GILBERTSON,
H. G. CHAPPEL,
Committee.

INTERSTATE DENTAL FRATERNITY.

THE annual meeting of the Interstate Dental Fraternity will be held at the New Kimball House, Atlanta, Ga., on Monday, September 7, 1906.

The meeting and banquet will be in charge of Dr. Thos. P. Hinman, the vice-president for Georgia. Dr. Hinman's well-established reputation as a host is a sufficient guarantee for a royal good time for all the fraternity who can arrange to be there. Do not miss it.

R. M. SANGER, *Nat'l Sec'y.*

KANSAS CITY DENTAL SOCIETY.

THE Kansas City (Mo.) Dental Society has appointed a committee to arrange for a great dental clinic, to be held February 22 and 23, 1907.

The committee is represented by Dr. J. P. Root, as president and the following chairmen: Essays—J. D. Patterson. Reception—D. J. McMillen. Clinics—F. G. Worthley. Smoker—C. L. Hungerford. Exhibits—T. E. Purcell. Finance—C. L. Van Fossen. Program—M. C. Carpenter. Publication—J. W. Hull. Arrangements—R. M. Seibel. Railroads—F. W. Franklin.

The chairmen of the different committees have been at work, even at this early date, and have arranged for quarters at the Midland, having secured the large banquet hall for the clinics, and enough other space for the exhibits, etc. Everything is being planned to make this greater than all former clinics.

The clinicians will be selected from among the most prominent men in their respective lines. One evening will be devoted to essays, limited to two in number, and will be given by men well known in scientific dentistry. A complimentary banquet will be given the clinicians and essayists by the local dentists.

The committeemen back of this undertaking realize its magnitude, and expect to exercise the necessary energy to push it to a successful end. All ethical dentists and dental societies are requested to keep the dates in mind and to co-operate in making this a great dental gathering and the greatest of all practical dental clinics.

J. W. HULL,
Ch'man Pub. Committee.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE thirty-eighth annual meeting of the Pennsylvania State Dental Society will be held at the Bellevue-Stratford Hotel, Philadelphia, Pa., June 26th, 27th, and 28th. A cordial invitation to be present is extended. Arrange your appointment book to conform with the above dates.

Special rates on railroads. Ask for certificates when purchasing ticket.

LUTHER M. WEAVER, *Sec'y.*

PSI OMEGA FRATERNITY.

ALL members of the Psi Omega Fraternity attending the meeting of the Pennsylvania State Dental Society at the Bellevue-Stratford, Philadelphia, June 26 to 28, 1906, are cordially invited to attend a reunion dinner, to be held under the auspices of the Philadelphia Alumni Chapter. Details at the meeting.

J. ARTHUR STANDEN, *Chairman,*
1220 Locust st., Phila., Pa.

MISSOURI STATE DENTAL ASSOCIATION.

THE forty-first annual meeting of the Missouri State Dental Association will be held at Springfield, Mo., June 5, 6, and 7, 1906.

An unusually interesting program is being arranged. A number of men eminent in the profession have signified their intention of being present and the meeting promises to be the best in the history of the association.

All ethical dentists are cordially invited to be present.

SAM T. BASSETT, *Cor. Sec'y.*
St. Louis, Mo.

SOUTH DAKOTA STATE DENTAL SOCIETY.

THE next regular meeting of the South Dakota State Dental Society will be held June 12, 13, and 14, 1906, in Vermilion, S. D.

W. F. PRICE, *Sec'y,*
Vermilion, S. D.

LOUISIANA STATE DENTAL SOCIETY.

THE annual meeting of the Louisiana State Dental Society will be held at New Orleans, La., June 1 and 2, 1906.

A. L. PLOUGH, *Cor. Sec'y,*
New Orleans, La.

MINNESOTA STATE DENTAL ASSOCIATION.

THE twenty-third annual meeting of the Minnesota State Dental Association will be held in Minneapolis, Minn., at the Dental Department of the State University, on June 11, 12, and 13, 1906.

J. F. MCCREA, *President.*
F. E. COBB, *Sec'y,*
Minneapolis, Minn.

KENTUCKY STATE DENTAL ASSOCIATION.

CHANGE OF PLACE AND DATE.

THE next annual meeting of the Kentucky State Dental Association will convene at Louisville, Ky., June 12, 13, and 14, 1906, during "Home-coming Week."

Special railroad rates of one fare for round trip can be obtained. All former residents of Kentucky are especially invited. A cordial invitation is extended to the profession.

W. M. RANDALL, *Sec'y,*
Cor. Brook and B'way,
Louisville, Ky.

MISSISSIPPI DENTAL ASSOCIATION.

THE thirteenth annual meeting of the Mississippi Dental Association will be held in Gulfport, June 6, 7, and 8, 1906.

All ethical practitioners of this and other states are cordially invited to attend. Every effort is being made to have this the largest and most profitable meeting ever held, and the pleasures of Gulfport, on the coast, at this time of year, alone form a special feature.

Reduced hotel accommodations and the usual reduced rates on all railroads will be obtained.

For complete details address

E. DOUGLAS HOOD, *Sec'y*,
Tupelo, Miss.

NORTH CAROLINA DENTAL SOCIETY.

THE thirty-second annual meeting of the North Carolina Dental Society will be held at High Point, N. C., June 20 to 23, 1906.

J. C. WATKINS, *Sec'y*,
Winston-Salem, N. C.

SOUTH CAROLINA STATE DENTAL ASSOCIATION.

THE annual meeting of the South Carolina State Dental Association will be held in the city of Charleston, on the Isle of Palms, S. C., June 26 to 29, 1906. We expect a very profitable and enjoyable meeting, and a cordial invitation is extended to all ethical dentists.

EUSTON N. KIBLER, *Cor. Sec'y*,
Prosperity, S. C.

E. K. WEDELSTAEDT CLUB OF IOWA.

THE E. K. Wedelstaedt Club of Iowa and the G. V. Black Club of St. Paul, Minn., will hold a joint clinic in Clear Lake, Ia., June 25 and 26, 1906.

A cordial invitation is extended to all reputable practitioners. There will be reduced railroad rates on all roads to this summer resort.

For further information address

WILLIAM FINN, *Sec'y*,
Kimball bldg., Cedar Rapids, Ia.

GEORGIA STATE DENTAL SOCIETY.

THE thirty-eighth annual meeting of the Georgia State Dental Society will be held June 19 to 21, 1906, at Savannah, Ga. This change in time of meeting is to avoid conflict with the Florida Association and for the convenience of manufacturers; also for other reasons it has been considered advisable. The original dates set for this meeting were June 12th to 14th inclusive.

An excellent program of papers and clinics is being prepared, and a most pleasant and profitable meeting is anticipated. A cordial invitation is extended to all ethical members of the profession.

S. H. MCKEE, *President*.

DISTRICT OF COLUMBIA DENTAL SOCIETY

AND THE

MARYLAND STATE DENTAL ASSOCIATION.

THE twelfth annual union meeting of the Maryland State Dental Association and the District of Columbia Dental Society will be held in the dental department of the George Washington University, 1325 "H" st., Washington, D. C., June 7, 8, and 9, 1906. The officers of both associations, through the committee of arrangements, extend a cordial invitation to all ethical dentists to attend this meeting.

H. M. SCHOOLEY, *Chairman*,
Washington, D. C.

INDIANA STATE DENTAL ASSOCIATION.

THE forty-eighth annual meeting of the Indiana State Dental Association will be held at the West Baden and French Lick Springs, Indiana, June 26, 27, and 28, 1906.

The social side of this meeting will be a feature, while the papers and clinics have promise of being the best ever given at this society.

Ethical practitioners are invited to resort, recuperate, and re-illume with us.

R. A. ADAMS, *Sec'y*,
Clinton, Ind.

TEXAS STATE DENTAL ASSOCIATION.

The twenty-sixth annual meeting of the Texas State Dental Association will be held in the city of Galveston, Texas, June 14, 15, and 16, 1906.

The indications are that this meeting will be the best ever held in Texas. All ethical practitioners are extended a cordial invitation to meet with us.

Bush Jones, *Sec'y*, Dallas, Texas.

MICHIGAN STATE DENTAL ASSOCIATION.

The semi-centennial meeting of the Michigan State Dental Association will be held in Detroit, July 9, 10, and 11, 1906. A most cordial invitation is extended to all reputable practitioners to attend this fiftieth anniversary of the association, and a most interesting program is in preparation to celebrate this important occasion.

Edward B. Spalding, *Sec'y*,
Detroit, Mich.

WISCONSIN STATE DENTAL SOCIETY.

The thirty-sixth annual meeting of the Wisconsin State Dental Society will be held at Madison, Wis., July 17, 18, and 19, 1906. The program committee is arranging an unusually interesting program. Some of the most eminent men in the profession will be with us and all indications point to one of the best meetings ever held in Wisconsin. All ethical dentists are most cordially invited to attend.

W. H. Mueller, *Sec'y*,
21 W. Main st., Madison, Wis.

NEW JERSEY STATE DENTAL SOCIETY.

The New Jersey State Dental Society will hold its thirty-sixth annual meeting in the Auditorium, Asbury Park, N. J., commencing Wednesday, July 18th and continuing until Saturday, July 21st. New demonstrations, clinics, and instructive papers will be the great feature of this meeting.

Accommodations can be secured with the Hotel Columbia at a rate of $3.00 per day two in a room, and $3.50 for one person in a room. Write early and secure your room. A smoker will be given the members, guests, and exhibitors on Thursday evening, July 19th, at 10.30.

Pennsylvania and the Central R. R. of New Jersey carry passengers from all points to Asbury Park. Over eight hundred dentists registered last year. Asbury Park is a splendid place on the sea-shore to spend your vacation, and the state society will give the best instructions to help you in your work throughout the year. Cut off your appointments from the 18th to the 21st and come and see for yourself.

Chas. A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

Notice from Clinic Committee.

An opportunity is afforded anyone having a difficult case in surgery, orthodontia, operative or prosthetic dentistry, to present the case for consultation at the coming meeting at Asbury Park, N. J., July 18th to 20th. It is hoped that advantage will be taken of this chance to gain the opinion and advice of men of exceptional ability in their special lines.

Correspondence is solicited. The committee desires a concise history of the cases on or before May 30th, if possible.

J. G. Halsey, *Chairman*,
Swedesboro, N. J.

ILLINOIS STATE DENTAL SOCIETY.

The forty-second annual meeting of the Illinois State Dental Society was held in Springfield, May 8 to 11, 1906. The following officers were elected: Elgin MaWhinney, Chicago, president; T. P. Donelan, Springfield, vice-president; Arthur D. Black, Chicago, secretary; J. T. Cummins, Metropolis, librarian. The 1907 meeting will be held at Quincy, May 7th, 8th, 9th, and 10th.

By a systematic campaign of organization this society has during the past two years increased its membership from less than four hundred to about fifteen hundred members. Officials of other societies who may be interested in this work are invited to correspond with the undersigned.

Arthur D. Black, *Sec'y*,
31 Washington st., Chicago.

MAINE DENTAL SOCIETY.

The Maine Dental Society will hold its forty-first annual meeting at the Kineo House, Moosehead Lake, Maine, Tuesday, Wednesday, and Thursday, July 17, 18, and 19, 1906.

H. A. Kelley, *Sec'y.*
Portland, Me.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

The Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg, June 5 to 8, 1906.

For papers and particulars address

Dr. N. C. Schaeffer, *Sec'y Dental Council,*
Harrisburg, Pa.

NEW HAMPSHIRE BOARD OF REGISTRATION.

The annual meeting and examination of the New Hampshire Board of Registration in Dentistry will be held in Manchester, N. H., June 13, 14, and 15, 1906.

A. J. Sawyer, *Sec'y,*
Manchester, N. H.

ILLINOIS BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held in Chicago, at the Northwestern University Dental School, southeast corner of Lake and Dearborn streets, beginning Monday, June 4, 1906, at 9 A.M.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: (1) Any person who has been engaged in the actual, legal, and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (2) is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university; or (3) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee is twenty dollars ($20) with the additional fee of five dollars ($5) for a license.

Address all communications to

J. G. Reid, *Sec'y,*
1204 Trude bldg., Chicago, Ill

CONNECTICUT DENTAL COMMISSIONERS.

The Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Wednesday, Thursday, and Friday, June 27, 28, and 29, 1906, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before said meeting.

All applicants should apply to the recorder for proper blanks and rules for conducting the examination. Application blanks must be filled in and sworn to, and with fee, filed with the recorder on or before June 20, 1906.

The annual meeting of the Commission for the election of officers and to transact any business proper to come before said meeting will be held at 2 P.M., July 14, 1906.

Gilbert M. Griswold, *Recorder,*
783 Main st., Hartford, Conn.

WISCONSIN BOARD OF DENTAL EXAMINERS.

The next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates for license to practice dentistry in Wisconsin will be held Monday, June 18, 1906, at the Wisconsin College of Physicians and Surgeons, Milwaukee, Wis.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry for four consecutive years, or an apprentice to a reputable dentist for five years.

For further particulars apply to

J. J. Wright, *Sec'y,*
1218 Wells bldg., Milwaukee, Wis.

WEST VIRGINIA BOARD OF DENTAL EXAMINERS.

The West Virginia State Board of Dental Examiners will hold their next meeting for the examination of candidates at Charleston, W. Va., June 6, 7, and 8, 1906. For further information address

H. M. Van Voorhis, *Sec'y.*
Morgantown, W. Va.

OHIO BOARD OF DENTAL EXAMINERS.

The regular semi-annual meeting of the Board of Dental Examiners of the State of Ohio, will be held in Columbus, Ohio, June 26, 27, and 28, 1906. Only graduates are eligible to examination. Application, accompanied by the fee of $20, should be filed with the secretary by June 16th. For further information address

H. C. Brown, *Sec'y,*
185 E. State st., Columbus, Ohio.

MINNESOTA BOARD OF DENTAL EXAMINERS.

The Minnesota State Board of Dental Examiners will hold a special meeting on June 14, 15, and 16, 1906, at the dental department of the State University in Minneapolis, Minn., to examine those who desire a license in Minnesota. All applications must be in by noon of June 14th.

Geo. S. Todd, *Sec'y,*
Lake City, Minn.

KENTUCKY BOARD OF EXAMINERS.

The Kentucky State Board of Dental Examiners will hold their next meeting at Louisville, June 5, 1906. All applicants will be examined in regular college branches, practical work, gold and amalgam fillings. One piece of metal work, materials, small instruments, and an engine must be furnished by the candidate. A fee of $20 will be charged.

For further information, address

J. Richard Wallace, *President,*
"The Masonic," Louisville, Ky.

SOUTH CAROLINA BOARD OF DENTAL EXAMINERS.

The South Carolina State Board of Dental Examiners will meet in annual session at Isle of Palms, June 22, 1906, for the purpose of examining applicants. Examinations will be both theoretical and practical. Applicants must furnish instruments and material for any demonstrations called for by the board.

B. Rutledge, *Sec'y,*
Florence, S. C.

IOWA BOARD OF DENTAL EXAMINERS.

The Iowa State Board of Dental Examiners will hold its next meeting at Iowa City, beginning at 9 A.M., Thursday, June 14, 1906.

Practical examination will be held in operative dentistry and written examination in the following branches: anatomy, physiology, chemistry, pathology, therapeutics, materia medica, histology, hygiene, bacteriology, prosthetic dentistry, oral surgery, metallurgy, operative dentistry, orthodontia, and jurisprudence. All applications for examination must be filed with secretary by June 5th.

For application blanks and further information apply to

E. D. Brower, *Sec'y,*
LeMars, Iowa.

MASSACHUSETTS BOARD OF REGISTRATION.

A meeting of the Massachusetts Board of Registration in Dentistry for the examination of candidates will be held in Boston, Mass., June 27, 28, 29, 1906.

Candidates who have applied for examination will report to the secretary, Wednesday, June 27th, at 10 o'clock A.M., at Harvard College Dental Infirmary, North Grove street, prepared with rubber dam, gold, plastic filling materials and instruments, to demonstrate their skill in operative dentistry. Anyone who wishes may bring his patient. So far as possible patients will be furnished. The board in every instance selects the cavity to be filled. Partially prepared cavities never accepted.

The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridge work, orthodontia, anatomy, histology, surgery, pathology, materia medica, therapeutics, physiology, bacteriology, anesthesia, chemistry, and metallurgy, and will be held at Civil Service rooms, State-house, from Thursday, June 28th, 9.30 o'clock A.M., until Friday P.M. June 29th.

All applications, together with the fee of twenty dollars, if first examination, must be filed with the secretary of the board on or before June 20th, as no application for this meeting will be received after that date.

Hereafter candidates for second and subsequent examinations will be required to fill out an application blank and forward it to the secretary as above.

Every candidate for examination must be twenty-one years of age. Application blanks may be obtained from the secretary. Temporary licenses are never granted. The fee for third and subsequent examinations is $5.00

G. E. MITCHELL, *Sec'y*,
Haverhill, Mass.

IDAHO BOARD OF DENTAL EXAMINERS.

THE Idaho Board of Dental Examiners meets in Boisé City, June 13, 14, and 15, 1906, for the purpose of examining applicants for license to practice dentistry in Idaho. Second day devoted to practical operative dentistry, applicants furnishing instruments and material.

C. E. M. LOUX, *Sec'y*,
Pocatello, Idaho.

NORTH CAROLINA BOARD OF DENTAL EXAMINERS.

THE regular annual meeting of the North Carolina State Board of Dental Examiners for the examination of applicants will be held in High Point, N. C., June 18, 19, and 20, 1906.

Written examinations in all the regular college branches will be required, also practical work in both operative and mechanical dentistry. As only graduates of reputable dental colleges will be admitted to examinations, it will be necessary for each applicant to exhibit his diploma before being registered for examination.

For further information address

R. H. JONES, *Sec'y*,
Winston-Salem, N. C.

VIRGINIA BOARD OF EXAMINERS.

THE next meeting of the Virginia State Board of Dental Examiners will be held at the University College of Medicine, in Richmond, Va., beginning Tuesday morning, June 12, 1906, at 9 o'clock.

R. H. WALKER, *Sec'y*,
Norfolk, Va.

INDIANA BOARD OF DENTAL EXAMINERS.

THE Indiana State Board of Dental Examiners will hold its next meeting in the Capitol building at Indianapolis, beginning at 9 o'clock, Tuesday, June 12, 1906, and continuing for three days. All applicants for registration in the state will be examined at this time.

Applications must be in the hands of the secretary at least five days prior to above date. For further information apply to

F. R. HENSHAW, *Sec'y*,
Middletown, Indiana.

DISTRICT OF COLUMBIA BOARD OF DENTAL EXAMINERS.

THE semi-annual examination of the Board of Dental Examiners for the District of Columbia will be held at the George Washington University, Washington, D. C., July 5, 6, and 7, 1906. Examination fee ten dollars.

SHELDON G. DAVIS, *Sec'y*.

ARIZONA BOARD OF DENTAL EXAMINERS.

THE Arizona Board of Dental Examiners will meet at Tucson, Ariz., July 2, 3, and 4, 1906. Fee twenty-five dollars ($25).

WM. P. SIMS, *Sec'y*,
Bisbee, Ariz.

MONTANA BOARD OF DENTAL EXAMINERS.

THE next annual examination of the Montana State Board of Dental Examiners will be held in the city of Helena, July 16, 17, and 18, 1906. For further particulars communicate with

B. J. KEENAN, *Sec'y*,
Butte, Mont.

RHODE ISLAND BOARD OF REGISTRATION.

The Rhode Island State Board of Registration in Dentistry will hold its next meeting for the examination of candidates at the Statehouse, Providence, July 10, 11, and 12, 1906, beginning each day promptly at 9 A.M. Applications, together with the fee of twenty dollars, if first examination, should be in the hands of the secretary not later than July 3d.

W. S. Kenyon, *Sec'y*,
301 Westminster st., Providence, R. I.

VERMONT BOARD OF DENTAL EXAMINERS.

The next meeting of the Vermont Board of Dental Examiners for the examination of candidates to practice dentistry will be held at Montpelier, July 10, 11, and 12, 1906, commencing at 2 P.M. on the 10th. Headquarters will be at the Pavilion Hotel.

Application, together with the fee of $25, must positively be in the hands of the secretary before July 1st. Candidates for third examination must notify the secretary before July 1st, inclosing the fee of $5. For information, application blanks, and other blanks required, apply to

Geo. F. Cheney, *Sec'y*,
St. Johnsbury, Vermont.

NEW JERSEY BOARD OF REGISTRATION.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in Trenton, N. J., on July 9, 10, 11, 12, and 13, 1906. Practical and theoretical work must be all completed at that time. Sessions begin promptly at 9 A.M. each day. All applications must be in the hands of the secretary by July 1st.

For further information kindly address

Charles A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

SOUTH DAKOTA BOARD OF EXAMINERS.

The next meeting of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, S. D., beginning July 31st, at 1.30 P.M., and continuing through the days of August 1st and 2d. All persons wishing to take the examination must send in the examination fee of $10 before July 24th. Candidates must bring operating instruments, including dental engine, and such other appliances and materials as are necessary to do crown and bridge work.

G. W. Collins,
Vermilion, S. D.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING APRIL 1906.

April 3.

No. 816,668, to Lloyd S. Lourie. Dental instrument for raising barbs upon wires.

No. 816,685, to Charles A. Sevier. Shield and moistener for dental tools.

No. 816,828, to Nathan H. Smith. Dental contour pliers.

April 17.

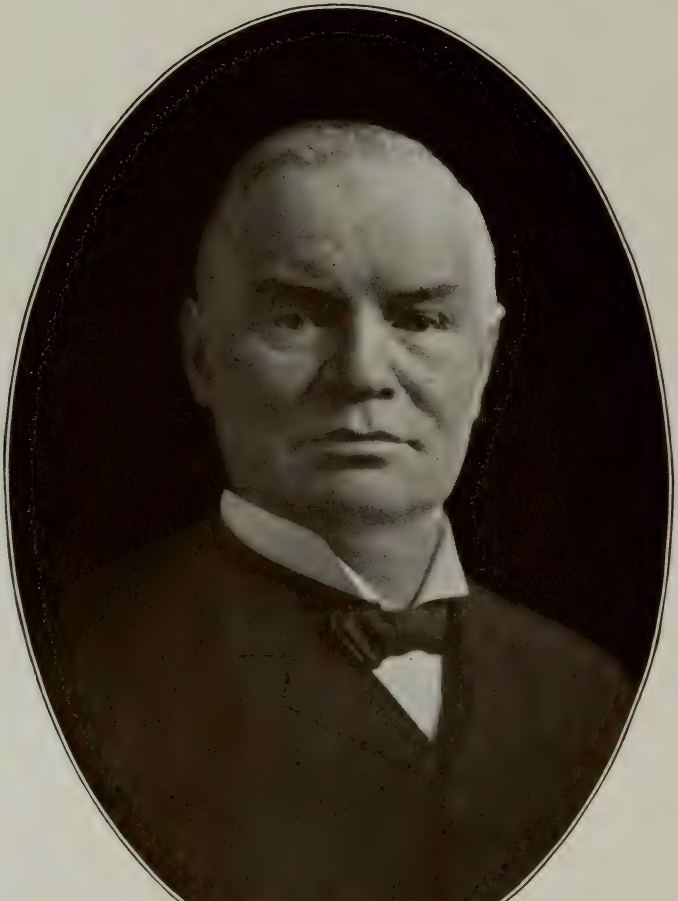
No. 817,767, to John F. Hammond. Electric furnace.

No. 818,123, to Albert Rousseau. Mask for administering anesthetics.

April 24.

No. 818,661, to Arthur H. Brown. Crown and Bridge work.

No. 818,940, to Henry S. Davis. Saliva ejector.



DR. C. W. STAINTON.

THE

DENTAL COSMOS.

VOL. XLVIII. JULY 1906. No. 7.

ORIGINAL COMMUNICATIONS.

GOLD INLAYS FOR BRIDGE ANCHORAGES; ALSO HOOD ABUTMENTS.

By **THOMAS P. HINMAN, D.D.S., Atlanta, Ga.,**

PROFESSOR OF ORTHODONTIA, ORAL SURGERY, AND PORCELAIN ART, SOUTHERN DENTAL COLLEGE, ATLANTA, GA.

(Read before the New York Odontological Society at its regular monthly meeting, November 6, 1905.)

THE purpose of this paper will be to elucidate several unique plans for bridge attachment.

The calm that followed the hurricane that swept the country when the universal application of the porcelain inlay was advocated by some enthusiasts, has given us time to gather our scattered wits and to contemplate some of the inevitable wrecks that have followed in its wake. And from the after-thoughts has come the more extensive application of the gold inlay, and I, with many others, have applied it as an anchorage for bridge work, finding it both esthetic and secure.

In presenting this subject for your consideration, I deem it advisable to review some of the methods used for securing anchorage in bridge work, and also to show this rather modern method of bridge attachment. For illustrative purposes I will use one of the most common conditions found in the mouth requiring restoration with bridge work, *i.e.* the loss of the upper first and second bicuspids where the canine and first molar are intact.

One of the most common practices for the replacement of these teeth has been the placing of a gold crown on the first molar, and then either to devitalize the canine in order to subsequently insert upon it a Richmond crown, or possibly, instead of devitalizing the pulp, to simply adapt the usual open-face crown. Some operators, however, have modified the open-face crown by devitalizing the pulp in the canine and anchoring a pin in the pulp-chamber, afterward burnishing or swaging a hood which is transfixed by the pin and soldered to it. While these methods have their several advantages, it is the purpose of this paper to introduce for your consideration a method that does not necessitate either the crowning of the first molar or the devitalizing of the pulp of the canine, which obviates the display of gold resulting from the use of the Richmond or open-face crowns, and affords a secure and permanent attachment for the bridge.

The method here described is not given in the experimental stage, but has been used by the writer for several years. The hood has features that are original so far as I have been able to find. It possesses over the Alexander or Carmichael attachments—more commonly known as the staple hood—such advantages as ease of construction, greater strength, and mechanical correctness. This hood I will call a three-pin double-step hood. The method of construction is as follows (see Fig. 1):

First, examine the occlusion to ascertain whether there is enough space for the accommodation—on the lingual surface of the canine—of the thickness of gold necessary in order that the finished hood shall have the required strength. If there be not sufficient space available, grind away the enamel on the lingual surface of the canine. With a No. 2 stump corundum wheel cut a step one-sixteenth of an inch above the gum line on the lingual side, running mesio-distally, and of sufficient breadth to accommodate a hole made with a No. 3 round bur. In order to avoid weakening and subsequently fracturing the enamel, the hole should not be made too near the latter. With the same wheel cut a broader step just below a line drawn mesio-distally between the angles of the cusp sufficiently deep to accommodate two holes to be drilled with a No. 3 round bur. These holes straddle the pulp, and should be cut to the depth of one-sixteenth to three thirty-seconds of an inch.

Prepare a piece of annealed inlay gold 0.003 inch thick, wide enough to cover all of the lingual surfaces of the tooth and to lap the distal surface, the idea of having the gold to lap distally being to secure attachment for the solder used in uniting the bridge. Mallet and burnish this gold into the steps and to the lingual surface of the tooth. The plugger point for this purpose is made of a piece of orange-wood and is used in connection with an automatic mallet. The point of the plugger is cut wedge-shape and the tread squarely. Remove the gold and trim approximately, allowing for a wide lap on the distal side. Return the gold to the tooth, and puncture holes through it to correspond with the openings previously drilled into the steps. From No. 20-gage iridio-platinum wire make pins suitable for these holes, and allow them to project far enough through the gold so that they may become engaged in the modeling composition used to remove the gold and pins. With the gold and pins in position, take dry-heated modeling composition, and force it over the lingual side of the tooth, thus engaging both the pins and the gold; then chill the compound and remove it. (Fig. 2.) Run a model in sump and remove the modeling composition, care being taken that in so doing the pins are not withdrawn from the model. (Fig. 3.)

FIG. 1

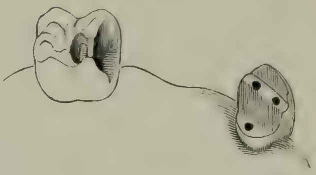


FIG. 2

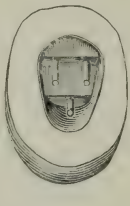
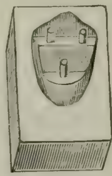
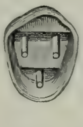


FIG. 3.



If the pins should come away with the compound, they may be replaced on the model if care be used. Heat up the model carefully, and with very small pieces of 22-k. solder attach the pins to the gold, always being careful not to use an excess of solder, which if done would cause the thin gold to become too stiff. When cool remove the investment, return the piece to the mouth, and carefully reburnish it. Be sure to allow a good lap of the gold on the distal surface. Remove it from the mouth and with or without investment thicken this hood with 20-k. solder, being careful that no solder runs over the margins and reaches the side that comes in contact with the tooth. Replace the hood in the mouth and grind it to a proper occlusion. (Fig. 4.) In cases of very close-bite occlusion it is sometimes advisable to grind the lower canine slightly, in order to gain additional space for the thickness of the hood, which is thus rendered sufficiently strong and resistant.

FIG. 4.



MOLAR ANCHORAGE.

Prepare a large approximo-occlusal cavity with a flat basal wall on the mesial surface of the first molar. Broaden out the cavity on the occlusal surface so as to secure a good dovetail. The bucco- and linguo-mesial walls should be flared well to the angles. These walls are chiseled away so that they will flare slightly toward the occlusal surface. The neck of the occlusal anchorage is made large enough to admit a No. 9 bur, in order that the inlay may not be weakened at that point. A gold inlay is now constructed by any method the operator may choose, to fit this cavity, although your essayist excludes hollow inlays in these cases. The inlay should be polished to a margin on the mesial side and ground to accurate occlusion.

Having the hood and gold inlay in position, take a wax bite and a plaster impression, and run the impression in some good investment compound—sump preferred. Set the pieces in an articulator, grind and back the facings, articulate them with the cusps waxed in position, remove the facings and cusps *en masse* from the model, invest them, and fill with 20-k. solder. These dummies should then be trimmed with the file, partially polished, and returned to the model and again waxed to position. Trim the model and invest as usual. After the wax has been boiled out, carefully fit two gold wedges of 22-k. gold plate at each end of the dummies—between them and the anchorages—flux and unite with 18-k. solder.

The object of the gold wedges is to prevent the solder from pulling the abutments, thus causing a misfit, as an accurate fit is here absolutely imperative. The dummies are then polished, and the hood and inlay are polished and finished after the bridge has been set. In this manner we are able to replace the bicuspids without any display of gold. In this same manner the first bicuspid may be replaced, using the second bicuspid as a posterior anchorage. I have had cases of this description in the mouth for several years, the hood and inlay having proved a satisfactory and secure anchorage.

FIG. 5.

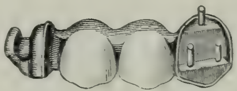


FIG. 6.

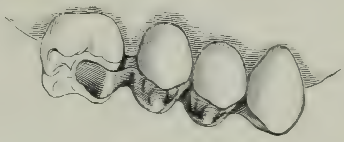


Fig. 5 shows the finished bridge.

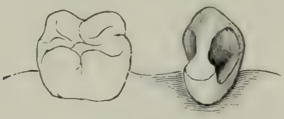
Fig. 6 shows the finished bridge in position.

I have some bridges doing good service, extending from the second molar to the canine, the posterior anchorage being a gold crown, and the anterior anchorage the hood here described. This hood may be applied to any of the anterior teeth, the result being as satisfactory when used on an incisor as when adapted on a canine, and has been successfully employed on both laterals to support the missing centrals. In one case I have replaced the centrals and laterals, using hoods on the canines. This bridge has been in position over a year, and has proved secure thus far. Of course where two hoods are used great care must be taken to drill the holes parallel. However, the difference between the diameter of a No. 3 bur and No. 20 iridio-platinum wire is sufficient to allow of some slight deviation in the alignment of the holes.

HOODS FOR BICUSPIDS.

Where the second bicuspid and the first molar have been lost and it is desired to replace them with a bridge, a convenient hood may be constructed somewhat after the Alexander method, but in my method I use no staple. Grind away the lingual cusp of the bicuspid (Fig. 7) sufficiently to allow for its replacement with gold. Cut cavities on the distal and mesial surfaces of the teeth of sufficient depth to have their cervical borders under the gum line. These cavities should be cut with a square-end fissure bur, and should form an arc of a circle bucco-lingually of sufficient breadth to reach as far as the buccal and lingual angles in both cavities. The lingual enamel is now trimmed away in order to secure slight bevel from the gum line to where the cusp has been ground off—this bevel leaning buccally. The matrix is made of inlay gold after the usual method, and is carried well over the cervical border of the cavities as well as under the gum margin on the lingual side. The making of this compound matrix may be facilitated by laying the annealed inlay gold on a piece of blotting paper, and by pressing and rotating upon the center of the gold the round end of a large cone-socket handle. If this be done for a few minutes, the gold will curl up on the sides, forming a cup-shaped piece. This piece should be annealed again before it is placed in the cavity. It should then be burnished and malleted in the cavity to close adaptation by means of an orange-wood plugger as previously described. It is well to protect the gold with a pledget of wet cotton in order to prevent tears in the matrix.

Fig. 7.



The matrix is now removed, thickened with 22-k. solder (Fig. 8), returned to the cavity, and the margins reburnished. Remove it once more in a modeling compound impression and bite, place it in an articulator, and adapt to it a form swaged of No. 36-gage pure gold to restore the lingual cusp. The latter is waxed in position and the lost parts are restored in wax. (Fig. 9.) Cut the tooth from the model, and invest it with the buccal side downward, heaping up the investment so as to protect the cusp and to just cover the lappings of the matrix. (Fig. 10.) Boil

Fig. 8.

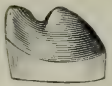


Fig. 9.

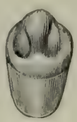
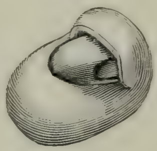


Fig. 10.



out the wax, and fill with 22- or 20-k. solder. If when the hood is returned to the mouth there is not sufficient solder to make a knuckle on the mesial side, more solder may be added by sweating. This may be done without re-investing the piece. The hood when finished will withstand the necessary stress of mastication, and will support a bridge of ordinary dimensions. This hood has all the advantages of a gold crown without the disadvantage resulting from the display of gold.

FIG. 11.

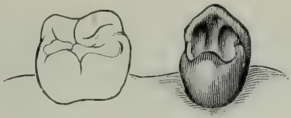


Fig. 11 shows the hood in position.

Replacing a lateral incisor where there are large cavities on the mesial and distal surfaces of the central incisor. This may be done (Fig. 12) by uniting the two cavities on the lingual side, leaving the labial enamel intact, or cutting it off when weak. Make a compound gold inlay and solder the facing to it. (Fig. 13.) I have several cases in my practice in which I have followed this method, one of which has been in position for several years. Fig. 14 represents the bridge in position.

FIG. 12.

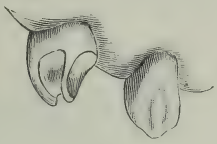


FIG. 13.

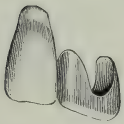
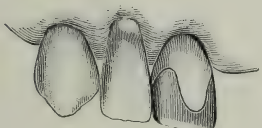


FIG. 14.



Replacing the first bicuspid, using no cusp or dummy, where the second bicuspid is decayed. (Fig. 15.) This may be done by making a compound cavity in the second bicuspid, constructing a gold inlay for it, and attaching to the latter a facing with solder. (Fig. 16.) The neck that unites the two cavities must be sufficient to withstand the impact of mastication.

FIG. 15.

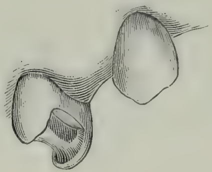


FIG. 16.

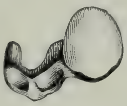


FIG. 17.

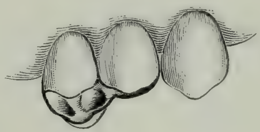


Fig. 17 shows the bridge in position.

Where gold inlays are used for anchorages, the surface to which the facing is soldered should be polished to a margin before the impression is taken, as otherwise it would be impossible to polish it properly after the piece is completed. In the use of gold inlays for anchorages in bridge work, I have never found it necessary to use pins in them, although they may be employed if the operator should so desire.

In conclusion let me say that I believe the gold inlay is in its infancy, and that the time will come when the more lengthy and tedious operations of filling large cavities with cohesive gold and the mallet will be a thing of the past; for just as artistic and permanent results can be obtained with the gold inlay with less strain on both the operator and patient.

A CONSIDERATION OF SOME CAUSES OF MALOCCLUSION OF THE TEETH.

By **B. FRANK GRAY, D.D.S., Colorado Springs, Colo.**

THE prevalence of malocclusion of the teeth is almost universal, normal occlusion being of such rare occurrence that when it comes under our observation it is a matter of particular interest and comment.

We have come to believe that malocclusion is nearly always acquired; that it is not often hereditary, as has been taught to a greater or less extent in the past.

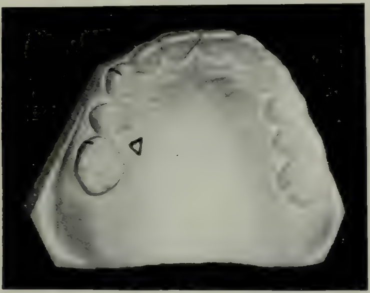
Among those causes which are most common may be cited the premature loss of the deciduous teeth, whether it result from neglect on the part of the parents—thus making extraction practically unavoidable—or whether it result from a lack of appreciation of its deleterious results on the part of the dentist. It is true that parents are too prone to give but little consideration to the teeth of the first dentition; the usual impression with them is that the so-called "baby teeth" may be sacrificed, if attacked by caries, with very little compunction, because the child will, of course, be supplied with permanent teeth to take their place. To how great an extent the dental profession is responsible for this most baneful misconception it is difficult to say. My impression is that the profession has done but a fraction of its duty toward the public in this matter. When it is known that neglect of this sort causes malocclusion of the permanent teeth, with consequent deformity of the face, is it not high time that every man should gain an appreciation of his duty toward those who come under his care, and whose interests in this matter are wholly entrusted to him?

It is a well-recognized fact that the growth and development of the jaws is downward and forward, and the influence of the first permanent molar in the development of the anterior part of the arch is so decidedly marked that the premature loss of a deciduous molar invites what is most sure to follow—malocclusion.

Sixty-seven years ago Dr. Chapin A. Harris wrote as follows: "Irregularity is most frequently produced by a premature loss of one or more of the temporaries and a consequent contraction of the maxillæ, by an incongruity between the absorption of the fangs of the first denture and the growth of the second teeth, and by the presence of supernumerary teeth. . . . It should be guarded against, for any such disturbance, whether in the upper or lower jaw, is productive of injury to the health of the teeth and to the beauty of the mouth." Thus at so early a day as that we find such wholesome advice being given as I have quoted, and yet today I find dentists actually suggesting to patients the inadvisability of caring for such teeth!

In the illustration (Fig. 1) is seen an interesting example of the effect of the premature loss of a deciduous tooth. This loss having occurred, the first permanent molar drifted forward prematurely, encroaching upon the space intended for the second bicuspid, which latter tooth was found embedded or impacted lingually to the first bicuspid and first permanent molar, as indicated in the illustration. Naturally enough, this unerupted tooth can never be of any use unless space for its normal placement be regained, and its eruption be secured.

FIG. 1.



But to me the case of this child, who is about thirteen years of age, is of further interest. It will be noted that the lower left canine has been forced into a lingual position, with the consequent shifting of the median line to the left. This may be explained, I believe, in this way: As the upper right first permanent molar migrated forward and appropriated the position of the second bicuspid, there was, for a long time at least, an abnormal force brought to bear upon the distal inclined planes of the lower first permanent molar on this side of the mouth; the effect of this abnormal force, together with the normal tendency of the teeth to move forward, has been to crowd the lower left canine into a position lingual to the line of occlusion, as shown in Fig. 2. The force required for this displacement, starting, as it must have done, with the first permanent molars, was exerted along the whole line of the arch to the lower left canine. I may be asked why the lower right canine was not the tooth to be displaced, and my only answer is, that the right one may have had the advantage of being further erupted and more resistive to displacement than the left canine: such a fact would explain the matter, to my way of thinking.

FIG. 3.

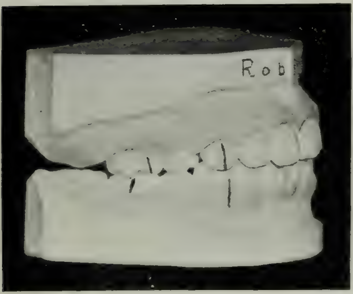


FIG. 2

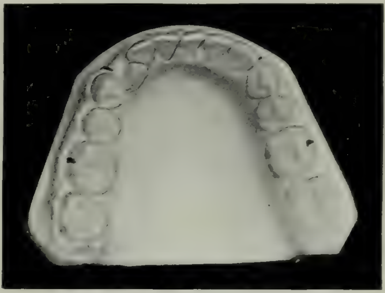
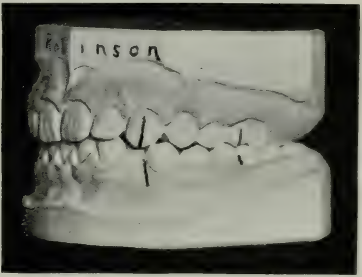
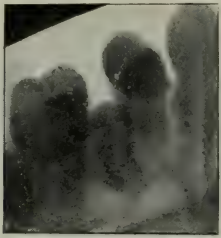


FIG. 4.



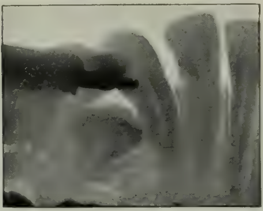
The mesio-distal relation of the molar teeth of each side is shown in Figs. 3 and 4. It is true that these illustrations do not show any pronounced deformity such as we are all familiar with, but they do show a condition of malocclusion of which many patients would be glad to rid themselves. But, further than this, they serve to illustrate the results of neglect which I have been considering.

FIG. 5.



Therefore, in the case in point, in order to restore normal occlusion, we must not only regain the required space for the unerupted second bicuspid and bring the latter into place, but we must as well force the teeth of the lower right side in a distal direction to a considerable extent, and shift the median line to the right, thus gaining sufficient space for the full diameter of the displaced canine.

FIG. 7.

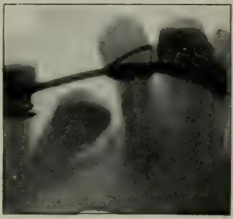


If the premature loss of a "baby tooth" can have such far-reaching results as this (and in many cases I have no doubt the results may be very much more complicated) then what shall we say about caring for the deciduous teeth? Is it not worth while to give them as close attention as is given the teeth of the permanent dentition? Indeed, are the results of neglect not more pernicious?

The illustrations 5 and 6 are made from X-ray photographs taken by Dr. A. H. Ketcham of Denver. As I take it, they are almost self-explanatory. Fig. 5 shows an impacted second bicuspid, and Fig. 6 was made from the same case after the operator had secured sufficient space to allow the eruption of the imprisoned tooth. Likewise Fig. 7 shows the peculiar manner in which a first bicuspid has been prevented from taking its normal position in the arch, and Fig 8 gives an excellent idea of the amount of space which has been secured for its release. These are such results as come from neglecting the teeth of the first dentition. I recently examined some models of a patient, who I presume was about twelve years of age, in which all the upper incisors were badly malposed. This result, I believe, is directly traceable to the causes just referred to.

FIG. 6.

FIG. 8.



Granting that as a result of neglect the premature loss of deciduous teeth may occasionally be unavoidable, it is important that the space in the arch which they occupied should be retained, pending the eruption of the permanent tooth. This must be done, of course, by the aid of mechanical devices, and it is considered of so much importance that it is not for a moment to be looked upon as a far-fetched theory or a fad; but it is of vital importance to the normal eruption and occlusion of the permanent teeth and the normal contour and symmetry of the face. Parents are awakening to the importance of having their children's teeth carefully preserved, but I believe the majority are still in need of wise counsel and instruction, such as the family dentist alone is in a favored position to give.

The question of a method for the preservation of deciduous teeth is not within the province of this paper; the profession is fully capable of caring for them, as well as the permanent teeth. My object is only to awaken an interest in the necessity of doing it.

Malocclusion of the teeth may also come from the retention of the deciduous teeth beyond the time which nature intended. This may be caused by the retarded absorption of the root of the tooth, or its failure to absorb, as in the case of a devitalized tooth. The influence of such a condition may be to wholly prevent the eruption of the succedaneous tooth, or at best to deflect it from its normal position. I have in my collection models of a case in which the upper first bicuspid was deflected in this manner, as well as rotated. The lower second bicuspid on the same side of the mouth had also been rotated out of position because of this malposition. This illustrates the pernicious results of a little neglect at a critical moment, and in some cases malocclusion starting from the deflection of a single tooth might persist until many teeth become disarranged. This would have been one of the rare opportunities when the dentist might have used his extracting forceps without fear of criticism by even the "non-extracting orthodontists"!

What I have had to say with reference to the preservation of the deciduous teeth applies very largely to the permanent teeth; particularly so to the first permanent molars. I understand quite well that the dilapidated condition of these most important teeth is often due to the failure on the part of parents to recognize them as being teeth of the permanent dentition: they frequently mistake them for the deciduous teeth. Here again is a point illustrating the necessity of educating people in the care of children's teeth, for if they recognize the importance of giving attention to the deciduous teeth, it does not matter so much if they do mistake a first permanent molar for a "baby tooth," so called; it will, in any event, have the attention necessary for its preservation. In extreme cases, where the salvation of this tooth is no longer possible, we are, again, called upon to preserve by some appliance the space it occupied. The influence of the first molar on the development of the anterior part of the arch—previously alluded to—is of the most vital importance, for its loss, unless followed by the necessary precautions, ofttimes results in malocclusion of an extreme type. The shortening of the arch, with the consequent lack of fulness of the face, etc., is a common result. I have wondered, after all, when we all realize how vitally important these teeth are to the proper development of the arch, as well as of the face itself, how many of them need really be sacrificed. If necessity be the mother of invention, I should say that the invention of a method for the preservation of these teeth will certainly occur to the dentist. I am of course referring particularly to those teeth in which caries has made most extensive inroads.

Likewise, though not to so grave an extent, the loss of any of the permanent teeth is pernicious in its influence. One of the worst errors the operator could make is to sacrifice the canine, that tooth giving, as it does to so marked an extent, symmetry to the arch and form and expression to the face.

But how shall we excuse those who extract the permanent teeth with the avowed purpose of curing malocclusion? Shall I not say they do it in an endeavor to improve the "articulation," for surely they would not do it to improve the occlusion. However, they may have the credit of good intentions, although so often they labor under the stress of a delusion. In any event, let us admit that they are attempting an improvement: would it not be a thousand times better to restore the teeth to normal occlusion? And right here I would like to say, if it be not too much of a digression, that the orthodontist is accused today by many in the dental profession of being an extremist, simply because he aims at and secures normal occlusion of the teeth. Did it ever seem to these gentlemen that it was proper, in filling a tooth, to leave frail enamel margins, to overlook a quantity of decay in the bottom of the cavity, and then insert a gold filling that has no density and leave it improperly finished? I am sure it did not. It is their endeavor to do this work thoroughly, giving careful attention to every step in its progress, and when completed they see to it that the normal contour of the tooth is restored. Please mark this latter statement,—the *normal contour* of the tooth. I ask, then, why they demand that the orthodontist have a lower ideal than the general practitioner of dentistry. That there is a normal occlusion of the teeth need scarcely be disputed. Dr. Angle has aptly said in his contribution to the "American Text-book of Dentistry," "The shapes of the cusps, crowns, roots, and even the very structural material of the teeth and their attachments, are all designed for the purpose of making occlusion the one grand object, in order that they may best serve the purpose for which they were intended—namely, the cutting and grinding of the food." What, then, should be our aim? Should it be toward rendering a service to our patient which is of questionable benefit at best, or shall our aim be the placement of the teeth as nature intended? The "small jaws and large teeth" proposition is not making so much stir as it used to do.

The work that has been done and is being done by the conscientious orthodontist, in bringing order out of chaos, in securing normal occlusion out of malocclusion, and harmony of features out of inharmony, is, I believe, having its healthy influence. The man who would extract the first permanent molars, or any other of the permanent teeth, for the cure of malocclusion certainly deserves the title of "odontocide"!

Many practitioners of dentistry advance the argument that patients are unable to secure the services of an orthodontist, and therefore they suggest to and perform for these patients the extraction of permanent teeth, with a view to patching things up in some sort of way, looking toward the improvement of the patient's condition of malocclusion. I would say in answer to this argument, It will be better for you, at least, to let the "other man" do this work rather than make such compromises, particularly when the results to be gained are so questionable.

The position taken and steadfastly maintained by Dr. Angle, that the full complement of teeth, arranged as nature intended—*i.e.* in normal occlusion—is necessary to their best possible use in the cutting and grinding of the food, as well as being essential to the facial lines which harmonize best with the facial type of the individual, is worthy of any man's serious thought, and the more study that is given this matter the more clearly will the truth of it appear. The moment the operator extracts a permanent tooth in order to assist him in an endeavor to correct a malocclusion, that moment he must be obliged to confess that he is not aiming to restore the teeth to normal occlusion.

ERRORS IN DENTAL EDUCATION.

By EUGENE S. TALBOT, M.S., D.D.S., M.D., LL.D., Chicago, Ill.

(Read before the Massachusetts Dental Society, June 5, 1906.)

> "We can make majors and officers every year, but not scholars."
>
> —*Anatomy of Melancholy.*

THE subject under consideration has been discussed from varied viewpoints since the first dental school was conceived. As through evolution generally, discussion of dental education has been improved by logical analysis and experience.

It would seem strange in this day of educational advancement were dentistry not to keep pace with other departments of science. Action and reaction is a law of progress. As prosperity follows depression in the business world, so does progression follow retrogression in the educational world. These variations result from the lack of proper application of general principles. The same law obtains in regard to professions. At present, the question arises whether there has been progress in dental education in the last three decades, or whether the profession is passing through a period of stress where arrest of development must occur. The following opinions of editors of dental journals tend to indicate the last probability. One says, "I have the greatest difficulty in getting material for my journal that has not been used over and over again many times." Another, "I believe Dr. Sudduth was correct when he said twenty years ago that the dental profession had written itself out." The third, "It seems to me that the dentist is in a groove, that there is nothing new to write about."

Dr. James Truman in an editorial, "Has the Art of Filling Teeth Progressed in Fifty Years?"* discussing the subject in a fair and unbiased manner, summing up asks, "Has this art, therefore, really made any progress since 1855? The superficial observer will be surprised at the question, and yet if the writer were to answer by the assertion, It has not, the astonishment would probably be intensified. The basic methods of filling teeth, shaping of cavities upon the mechanical principles to retain the filling, have not materially changed in fifty years, notwithstanding the earnest talk of 'extension for prevention.' The good men of 1850 taught the same thing, but had no catching title as a name for it. The real progress made in half a century has been in matters of detail and the invention of appliances. With the rubber dam, clamps, separators, engine, electric and power mallets, and the use of electric currents, there is not a tithe of the skill required today to insert a filling that was then demanded. Indeed, given good gold and the appliances named, he must be a blundering mechanic who cannot make a filling worthy of the best efforts of the early masters. All the talk that we hear so much of today regarding extension for prevention is simply throwing dust in the eyes of the modern operator to prevent him from seeing the records of past history, and reading therefrom that practical results —whether through the use of non-cohesive or cohesive gold—are worth more than a whole decade of theorizing."

Dr. Kirk* says, "The development of the art (dentistry) has been so thorough that though we may not safely say that future progress is impossible, yet the multiplicity of methods and devices at our command would seem sufficient in

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**International Dental Journal,* April 1903, p. 309.

*DENTAL COSMOS, January 1903, p. 68.

number and adequate in kind to meet all exigencies of practice."

Dr. Carlton* in addition to the above says, "We may add a wheel or two here and there simply to improve in a slight degree the mechanism, but it certainly seems as if the machinery and tools are nearly perfect."

Plate work has not advanced in the past forty or fifty years. Indeed it is questionable whether it be possible to improve the methods of that period. The average dentist will ask about crown and bridge work, and in reply I ask, Has the dentist studied the pathology of the alveolar process? Does he know the process was intended to support the root or roots holding one crown; that because of its sensitive nature, bands are not tolerated under the gum margin (the fact that occasionally bridge work lasts for some years does not disprove the rule); that excessive expansion of the dental arch for the correction of irregularities of the teeth without extraction results from lack of broad education? The province of the dentist should be to prevent germs from collecting in the mouth rather than to assist their formation. Porcelain inlays are not an advance in dentistry; there is no cement that will hold them, and no matter how careful he may be in obtaining the exact color, disease and age will change the color of the tooth?

The dentist stands upon the cusp of a molar and sees only teeth in the milky way and in the aurora borealis. Diseases beyond the teeth are an unknown quantity to him. In the past twenty years I have written over seventy papers based upon original research. No one has taken enough interest in original research as to the etiology of irregularities of the teeth or of interstitial gingivitis to confirm or dispute my findings. Not a single article has ever been written upon the pathology of either subject. It is notorious that proportionately to the number of practicing dentists very few journals are taken, much less read. Students do not buy books. On the other hand, let a new theory or principle be advanced in other departments of medicine and its members can and do discuss it offhand intelligently. Why this difference? Follow the course of instruction and the problem is soon solved.

LIMITATION OF DENTISTRY TO ITS MECHANICS.

What the controversy may have been when the first dental college was established sixty-four years ago is of little interest to us now, but certainly the trend of the medical profession was then to the opinion that the practice of dentistry was purely mechanic, differing entirely from the practice of medicine and without relationship; all will agree on that point. I am glad the dental college was established, for I believe it was necessary for our specialty to take up this particular line of work—the mechanics of dentistry—and pursue it to the end. The mechanics of dentistry, like all mechanics are narrow and limited; the highest perfection in them—other than a few details—having been reached more than thirty years ago.

The establishment of a separate college conferring a separate degree narrowed dental teaching, and gradually but surely developed the mechanics of dentistry to their limit. The result is, the profession—if it may be called such—view the lesions of the mouth only from the mechanic side. Students in most dental schools are taught that mechanics and operative dentistry are the principal departments, the other departments being minor studies; while the opposite is true. The result is that the student neglects these studies for branches seemingly likely to yield him most money after graduation. The excuse of the dental student for not doing research work, writing papers, reading journals and books, is that "he is too busy or tired." Would not this be true of other professions, judging by their hours of work?

Imagine two students of equal ability; one studies medicine, the other dentistry. After completion of their course, the graduate of medicine has broadened his knowledge of subjects generally, while the graduate of dentistry has narrowed his. The tendency of the teaching is toward the mechanic rather than the scientific. This then is the reason the dentist does not take journals, buy books and read them, do research work, and write original papers.

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*"University Training in Dental Education."

The "touch system," as J. P. Gray calls it, has developed to such an extent that the teachers and schools have become so impregnated with it, that embryology, evolution, the nervous system, anatomy, physiology, chemistry, materia medica, therapeusis, physics, etc., are all brushed aside as of minor importance. The "touch system" has become a monstrosity in dental colleges.

Evolution and degeneration go hand in hand; one cannot exist without the other. Monstrosities are sometimes born without skulls and brain; they are a reversion to the pre-vertebrate type. There are men gone daft on the "touch system." They imagine, as some have told me, they have an eye on the ends of the fingers, and see and feel the slightest inaccuracy or imperfection—such delicacy of touch have they developed. This degeneration is again a return to the pre-vertebrate type, aptly demonstrated in the snail and lobster whose eyes are located at the ends of the antennæ. What will become of the "touch system" and present college methods when a new cement is discovered to take the place of gold?

From the mechanic standpoint dentists are restless, ambitious individuals. All are trying to advance mechanics. Very little more can be accomplished, yet the inventive mind is still at work upon the impossible. Porcelain inlays, buttoning artificial bridges to the roots of the teeth, removable bridges and teeth, trying to make two or three roots support a partial or an entire set of teeth, implanting teeth, treatment of constitutional disease by local application, even the present method of filling, are but partially successful operations. The average dentist has very little conception of the systemic diseases in relation to the teeth, his teaching having been that of the most plausible theories of local causes.

CLINICS.

The state, national, and international congresses to be successful are obliged to conduct clinics. These grow more popular each year. The science of dentistry is also a failure. The side-shows—the tooth-fillers and plate-makers—and the camp-followers—with trinkets to sell—are the interesting attractions. The profession has been entertained *ad nauseam* by the same continuous performances for the past three decades. Dentists are content to listen at every society meeting to the same antique nursery rhymes—preparation of root-canals, treatment of alveolar abscess, choice of filling material, oral hygiene, etc., heard over and over again for decades—seeming to enjoy them, and applaud the speaker with as much energy as though they were original work heard for the first time.

The insertion of a gold or amalgam filling, or filling a root-canal by a recent graduate, creates as much enthusiasm as the monkey in a new uniform performing the same old tricks does among the children. William H. Trueman in his report of the ninth annual meeting of the National Dental Association held in Buffalo says,* "Eighty-five clinics were on the program for each day. One hesitates to criticize, especially after seeing an exhibit that seemed too trifling for notice surrounded hour after hour by an interested crowd; yet, looking over the list, an impression remains that a judicious pruning would have done no harm; not that there was anything objectionable, but rather a lack of novelty and importance in many of the table clinics and in some of the chair clinics. It seems a useless waste of time to demonstrate matters that have been accepted for many years."

Clinics, except where something new is presented, belong to the past. They originated when there were few or no dental colleges. Then dentists educated themselves or picked up what they could in dental offices. The preceptor had generally obtained his information in the same way. In those early days, clinics in state and national societies were clearly of value. Now but few dentists are not dental college graduates. A graduate of a dental school with the present methods of teaching and equipment ought to know how to perform all kinds of dental operations. A dental school whose teaching faculty is not up to this standard ought to be closed, since this is the inducement held out to the student when he matriculates.

**International Dental Journal*, 1905.

NON-APPRECIATION OF RESEARCH.

In connection with the narrow education of the dentist, is the entire loss of respect and honor to those who have done original research. Deans of dental colleges and editors of dental journals, to say nothing of the better class of dentists, entirely ignore the work of others. They use the work of others without credit as if it were common property. This method is so common that it is of rare occurrence for original research work in dental literature to be quoted, or credit given to those who have originated new thought. This demonstrates the unfamiliarity of dentists with the ethics of scientific investigation. Take any dental journal, read any article and discussion outside of mechanics, and the limited education of the author, as a rule, is apparent. The argument is often narrowed to an effort to explain etiology by a single case, when in the near future another case may be presented with a directly opposite history. There is an inability to grasp general principles.

"EXTENDING THE COURSE" NOT A REMEDY.

A short time ago, advancement in teaching dentistry was proposed by extending the course from three to four years. Fortunately this proposition was reconsidered; even five or six years of the present methods would not improve the graduate who had little or no preliminary training. Emerson says, "No man can learn that which he has no preparation for learning."

There are few workers in the dental field—whose horizons are not limited to the mechanics of the specialty—who know there is another side to be considered; that the present methods of education and practice are only partially successful; that a broad enough view has not been taken. The teeth are not a law unto themselves; they are a part of the entire body. Diseases that affect any part of the body must affect the teeth. The food that nourishes the body must nourish the teeth. Embryogeny, developmental pathology, and the central nervous system, enter into the structural development. These subjects are but slightly considered.

PROFESSIONAL EDUCATION IN THE FUTURE.

I can best illustrate what I have to say for future dental education by the history of the development of the Pullman sleeping car. When the first sleeping car was put on the Alton road between Chicago and Alton, the manufacturers of it had no idea of its future possibilities. They considered it similar to any other car, consequently did not make provision for the strength of the wheels. Older men will remember that upon the arrival of trains at stations it was necessary for a corps of men to hammer the wheels to ascertain if they were cracked; if they were, that car was sidetracked and another substituted. The popularity of the sleeping car soon demonstrated the necessity for better wheels in order that a sleeping car could run from Boston to San Francisco without the expense of testing the wheels at every station. They employed the best mechanics in the country, who invented the Allen paper car-wheel. This wheel, the height of perfection at that time, would stand the strain without many defects. but each wheel cost $86.50—a very expensive improvement. It remained for a graduate of the Boston School of Technology to conceive the idea of mixing metals so that a wheel could be cast superior to the Allen paper car-wheel. This wheel was put under the car at a small expense of $6.50. Most of the wheels now in use under the Pullman cars are manufactured by this process, at a saving of eighty dollars on each wheel.

As time advances, it is evident more and more that our present methods of practice are faulty. A radical change is necessary. These changes are not along the lines of mechanics but better education. Carlton says, "We are coming to the point where we must know the science of things rather than that which is merely on the surface." Progress says to us, "Cast in your lot with me and prosper; resist me and be crushed."

The return from a four years' course to one of three with a high-school education is an advance in the right direction. This requirement is not sufficient, for men should be educated not for the present but for the future, in order to hold positions with men who are active in the profession twenty-five to fifty years hence. The grand total enrollment of pupils for all the schools of the United States, public, private, special, higher, and lower, is 18,187,918. The enrollment in the common schools is 20.04 per cent. of the entire population as compared with 17.82 per cent. in 1870.

In the statistics for professional schools there are some interesting figures. In the 153 theologic schools of the country, according to the last report, there were 7372 students. Of these 2094 had received the degree A.B. or B.S.; that is, they were college graduates. In the 99 law schools there were 14,057 students, of whom 2429 had received degrees or were college graduates. In the 146 medical schools there were 27,062 students, of whom 2081 were college graduates; and in the 54 dental schools there were 8298 students, of whom only 203 had taken a college degree. The proportion of college graduates in the theologic schools is nearly twice as large as in the law, nearly four times as large as in the medical, and the dental students are comparatively speaking "not in it."

In any walk of life, graduates of universities and colleges are found working side by side with the men of ordinary education. The professions are fast filling with college-bred men. Dentistry for more than thirty years has been seeking its position among the professions. It may divide into a trade, the mechanics of dentistry, and stomatology, the science of diseases of the mouth. Educated men in all departments of life have the advantage over the uneducated.

There will be in the near future, an entirely different profession from that practicing today. By the present methods of filling teeth they are not saved. We wait until a cavity has formed and then fill it. If the tooth decays about the filling, we fill it again or crown it. We continue in this manner as long as the tooth remains in the mouth or until the patient dies. We do not save the teeth, as a nation or a family. Decay of the teeth is a natural process of evolution and disease. If they must be filled for the present, we should have some non-perishable material that can be pressed into place in a few minutes that would save the tooth and not disintegrate. The present method of packing gold, piece by piece, keeping the patient and operator on a continual strain, is pernicious and unscientific. How many articles have been written upon the sensitive dentin, and yet what little progress has been made on one of the simplest problems of etiology we have to contend with? The correction of irregularities of the teeth will not be based on "occlusion," but upon etiology, like other diseases. The successful practitioner of interstitial gingivitis must be well educated in every department of medicine. Indeed he must be far in advance of the average physician. He must know the laws governing diseases of the body.

The gums and alveolar process are more sensitive than other parts of the body, and therefore indicate systemic derangement quicker than other structures. The scientific eye and nose will often detect systemic disturbances long before they manifest themselves to the general practitioner. It is dawning upon the profession that many diseases of the body are due to the accumulation of different germs in the mouth. This was brought forcibly to the notice of the profession by A. H. Levings* in his work on "Surgical Bacteriology of the Mouth" read before the Section on Stomatology of the American Medical Association at Portland. The dentist should be able to observe the changes in the mouth and prevent germ development, or change the conditions to prevent systemic disease.

Dr. Harvey Cushing of Baltimore first showed the importance of sterilizing the mouth in operations on the stomach and intestines. The dentist should be able to recognize structural changes not only pathologic but developmental, and trace their etiology to the embryonic states. The development of the central nervous system, and, in turn, its relation to normal and abnormal development of other structures of the body, will then be understood. The dentist should understand the changes taking place in the internal organs associated with indigestion; as intestinal irritation, fermentation and putrefaction, hepatic insufficiency, and faulty metabolism. All departments of medicine are fast realizing the etiological importance of auto-intoxication. No specialty of medicine is so easily and quickly involved by auto-intoxication as stomatology. Indeed, the first symptoms of auto-intoxication are observed in the mouth. They readily indicate that grave difficulties are only a little farther ahead in store for the patient. The dentist, then, should be able to forewarn both the patient and the family physician. These subjects should come within the province of the practitioner of dentistry. Is there a scarcity of material for dental journals? Has the profession written itself out? Is there nothing new to write about? That will depend upon whether the dentist is mechanical or scientific.

People are eager to acquire knowledge in every walk of life. Why should the education of the dentist be dwarfed? There seems to be a concerted effort on the part of certain teachers to magnify manipulative skill, and decry an academic or medical education. One teacher says, "It is my experience that the higher the preliminary education is, the less satisfactory will be the dentist." Another, "The higher you go in preliminary training, less ability will there be at the end of the fingers to accomplish practical work." Still another, "I have never seen a graduate of medicine make a good dentist." Another, "The best educated men make the poorest dentists." These men always demonstrate their experiences with one or two cases, and afterward in an offhand manner state that they are not in opposition to better preliminary education.

This method of reasoning tends to poison teachers' minds until they come to believe an education is not a necessary accomplishment. I believe the manipulative skill theory is overestimated. When we are better educated and understand that decay about gold fillings, in many cases, is due to systemic causes rather than poor operations, their theory will soon vanish. To advance such a doctrine is narrow-minded, since our best master mechanics are college graduates. Indeed, there is no better proof of the opposite than that presented in the mechanic arts when college-bred men are taking the places of the uneducated. Educated men in certain departments of work are already advancing their specialty to such an extent that other similar institutions cannot successfully compete without employing equally educated men.

When Mr. Cleveland was a candidate for the presidency on the free-trade platform some years ago, a United States senator asked Mr. Carnegie what effect free trade would have upon his steel rail factories. He replied, "No effect whatever." Mr. Carnegie had anticipated such a change in the administration, and had employed a scientific engineer to go through his factories and change the methods of rail-making from the old hand method to that of machinery. The result was that after the mills were put in working order, ten men and boys could do the work of one hundred men without becoming overheated and fatigued, reducing the cost of manufacture to a minimum. Other manufacturers in order to compete have been required to employ educated as well as skilled workmen.

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* *Journ. Amer. Med. Association*, 1905.

According to certain authorities, stomatologists believe mechanical and operative dentistry to be a "minor qualification; while the medical school and all therein implied is the foundation of dentistry, nothing more being needed." This opinion, and the one that educated men cannot make good operators, do not merit discussion. Uttered by leading teachers, they tend to dwarf the minds of teachers and pupils and set low ideals for dental schools. The stomatologist, a broad not narrow man, believes that the mechanics of dentistry reached its highest development years ago; that the student is getting all of that branch necessary; that for the specialty to progress the student must have broader studies without losing anything now taught in dental schools.

PRELIMINARY EDUCATION OF THE DENTAL STUDENT.

The young man entering a dental college without a preliminary education is handicapped. Not understanding the studies of the first year, that year is wasted. Beginning with little or no education, the education received for a professional career is merely that obtained in a dental college. He has never been taught how to study. Four, five, or six years might make him slightly more proficient in manipulative skill, but would not develop the science and culture essential to compete with the man of the future. From the standpoint of a man of culture, he has had little or no training. The mechanical dentist in the past was not expected to have culture. The stomatologist of the future must be cultured to succeed. From a social standpoint he must stand abreast of members of other specialties. Even today, educated dentists are the most successful, prosperous practitioners.

In years gone by, men have made marks in the world without college education. Had college education been as popular then as today, many more men would through it have made reputations. In these days of colleges and college advantages, those best prepared mentally are the ones who succeed. It is a common law in evolution that a man with the quickest intellect and greatest power of endurance distances the weak or the stupid.

The methods of teaching pathology must be entirely changed. There is just as much difference between pathology as taught today, and as it should be taught, as there is between old methods of making car-wheels and new. The methods of teaching pathology today are an abomination and snare. They are hard to understand and explain, indeed teachers do not explain etiology, which underlies most pathology. A new method should be taught—distinct, easily comprehensible, and accounting for pathologic phenomena related to the head, face, jaws, and teeth, and structural changes of the body.

Before 1841, according to Hayden, mechanical and operative dentistry "was not in strictness the indispensable requisite qualification of a dental surgeon." The dentist to be qualified in his profession must be thoroughly educated in the science of medicine. What was true in early days of crude dentistry is still more true in days of advanced education.

The medical profession is fast adopting the methods of dental teaching by making its students proficient in methods of practice before they graduate. The dental college, perfected in this branch of learning, must now turn its attention to the science of medicine.

Assuming that the young man who wishes to practice stomatology is as competent as he who wishes to devote his time to any other specialty of medicine, how should he be educated? Obviously, in a general way, in the same manner. Few boys decide upon their vocation in life before they are sixteen. Those who expect to take up a professional life should be required to graduate from the high school. There are high schools and high schools. These differ throughout the United States both as to length of course and character of teaching. The National board should stipulate the length of course and the character of teaching. To begin the study of dental science comprehendingly and effectively the student must have a well-trained mind. His studies in the high school must first of all consist of the usual branches in English, Latin, science, history, and mathematics. Manual training at this early age will assist greatly, not only manipulative skill in the dental clinics, but will facilitate methods of handling instruments, appliances, and drugs in other departments of science. The principles of physics, chemistry, and general biology must be thoroughly understood ere graduation from the high schools. The younger the student begins those subjects the quicker he grasps the principles. Entering the university, the student should devote two years to advanced physics, chemistry, and biology. He should continue English, Latin, Greek, or German, or all four. He should obtain a good knowledge of evolution in general, and of man in particular; to do this he must understand embryology, particularly that of the nervous system. Bacteriology should be included if time permit. Pathology of the head, face, jaws, and teeth is based upon these foundation principles. No teacher can teach pathology correctly and easily without them.

A man thus equipped, and knowing how to study, is able to grasp any subject that may be presented in a dental college. Is it necessary, then, to subject such a man to a four years' course in a specialty in mechanics? Give him now all the mechanics both laboratory and operative that the college may require, but do it methodically and do not waste time teaching him.

Next to the preliminary qualification for the successful study of stomatology, the dental college faculty is to be considered. How can young men with the preliminary training required by stomatologists be received and educated by the average dental faculty? Are the present faculties capable of teaching such students? I have no ill feeling toward the faculty of any dental college, but, of necessity, great respect for men who labor for the good of humanity, by giving the best that they possess—without compensation—for the education of the coming generation. Being a teacher myself I feel that I can justly place this subject before the profession in an unbiased and friendly spirit. I have already called attention to the narrowness of dental graduates as being in part due to the college teaching and environment. The teachers were educated in the same schools. This has tended to narrow their views and teaching. Graduates of medicine and educated men complain of narrow, unscientific teaching in dental schools. Some have left colleges, and others have concluded not to practice because of this narrowness. The teaching of the relation of general diseases to the mouth, jaws, and teeth, and *vice versa,* is yet in its infancy. Unless dental teachers be more broadly educated, progress cannot be expected. The chaotic professional condition existing for the past three decades will continue, and humanity will not be properly served until dental colleges graduate better educated, broader-minded men and women.

MODE OF INITIATING REFORM.

How shall this great change in dental colleges be brought about? Let two or three universities in the North, and one in the South having dental departments demand a degree for admission just as some medical departments require. The dental profession is eager for the change and will use its influence to send students to such schools. The first schools that require such qualification will educate men who will eventually fill the chairs of other colleges. There is now a demand for such men. All are looking forward to the time when Harvard takes the lead. When this era has been established our specialty will take a position in the front ranks of medicine.

Fifty years ago, standing on Boston wharf, I saw a two-masted schooner seventy feet long, fastened alongside. The captain had been waiting two days for sufficient wind to take him out to sea. While standing there a little breeze came up from the northeast. The captain jumped aboard and took his station at the wheel. A man and a boy were ordered to take long poles and push the vessel away from the wharf. As the vessel moved away, the captain gave orders to raise the sails. Orders were then given to the man and boy to paddle the vessel away from the dock. As the captain stood at the wheel giving orders, shouting at the top of his voice, he seemed to me a wonderful man with a large amount of intelligence to master and control such a vessel. A short time ago, I went to the dock in New York city to take a steamer for Europe. The vessel was advertised to sail at ten in the morning. Before the hour the captain dressed in uniform stood upon the bridge. Precisely on the minute the throbbing of the engines was felt, and the great vessel, seven hundred feet long, carrying a crew of over three hundred men, quietly left her moorings and steamed away down the bay. What a contrast between the two vessels! Here was the captain standing quietly on the bridge; not a word had he spoken, and yet by pushing a button here and there, all the machinery of this great floating palace and all the crew were under perfect control. What a vast amount of knowledge was required to master the subject of steam, electricity, new methods of navigation—and so many men! What a change in fifty years! I said to myself, This captain is a finely educated man, but would the captain of the schooner be able to control a modern steamship?

DENTAL EDUCATION FROM A NEW STANDPOINT.

By WILLIAM H. TRUEMAN, D.D.S., Philadelphia, Pa.

(Read at the union meeting of the Seventh and Eighth District (N. Y.) Dental Societies, held at Rochester, N. Y., October 31—November 2, 1905.)

THE time was when American dental colleges were considered the best in the world; when their graduates had the wide world for their parish, and when their diplomas were universally honored and respected. That graduates of American dental colleges have not now a world-wide open door has subjected them to much adverse criticism, and has been the cause of much lamentation. Their professed friends, not understanding the conditions which have brought this about, have supposed it to be due to a relative lowering of standards, and have urged, have entreated, have demanded, that they should promptly wipe out this disgrace to the profession by so raising their standards as to regain their lost prestige. "It is a shame," they say, "that they have permitted themselves to become mere local affairs, whose diplomas are honored only under the shadow of the stars and stripes."

Concurrently with this alleged degradation of our professional schools, strange to say, the profession itself has thrived. Dental operations performed by graduates from these institutions still command the admiration of the world. In all departments of practical dentistry, in the invention and refinement of instruments, the discovery and adaptation of new materials, devising new and meritorious operations, and in the technique of dental operations and laboratory procedure, the profession in this country has led and still leads the world. So successful, indeed, has been the work of graduates from these discredited schools, that nowhere else in the wide world are dental operators so greatly and so generally appreciated, and so well remunerated, as they are in the United States, the only country under the sun that offers them a wide-open door.

That this is true, who will question?

That a relatively lower standard of our schools should be accompanied by such high attainments: that it should not be followed by a corresponding failure of efficiency in the profession depending upon them for its recruits, demands an explanation.

If the criticism of our dental schools be just, how can this be explained? Why are they not now in as good repute the world over as they once were?

This has prompted the title of my paper, "Dental Education from a New Standpoint."

THE DENTAL PROFESSION IN ENGLAND.

The change in the respect paid to American dental diplomas abroad dates from the time when the General Medical Council of Great Britain took the dental profession in that country under its protection in accordance with an act of Parliament providing for the same, and denied recognition to all American dental schools, except two, whose advertisements contained an educational qualification for prospective students. This has given rise to the presumption that if all of these schools had made the same demand this action would not have been taken, and to the further presumption that wherever the American dental schools reach a sufficiently high standard, they would again have, as before, full recognition in countries from which they are now debarred. This is an important point. It has been harped upon far more than it has been studied. That it is not better understood than it is, is a reflection of the general lack of information regarding professional matters so strikingly displayed in nearly all discussions upon educational affairs.

To understand this matter it is necessary to be familiar with the long struggle through which the dental profession in England reached legal recognition. This story is well told in an interesting volume written by Mr. Alfred Hill, and published by Trübner & Co., London, 1877, entitled, "The History of the Reform Movement in the Dental Profession in Great Britain." No one is competent to pass judgment upon the action of the General Medical Council who is not conversant with this interesting and instructive story; who is not, furthermore, conversant with the difference which exists, politically and socially, between that country and this. So far as the standards, the required preliminary education, the professional studies, and the attainments necessary for admission to full professional rank are concerned, there is but little material difference between the two countries; far less, indeed, than there seems to be. The dental schools of both countries turn out a fair measure of satisfactory practitioners. The dental schools on both sides of the sea are steadily on the advance, as new discoveries in dental science and contributory collateral sciences open the way.

I refer those interested in these matters to the proceedings in the General Medical Council of Great Britain as found in the *British Journal of Dental Science* for 1878 and 1879, the period during which this important body was organizing the dental profession of that country on its present basis, and to further discussions to be found in the *Journal of the British Dental Association* as from time to time desired changes in the curriculum were brought before it. Strange to say, no notice was taken of these important matters in the American dental journals, and but few on this side seem to be familiar with them, or appreciate their importance.

We cannot appreciate, in this democratic country of ours, the class distinctions that exist abroad. The laborer, the mechanic, the tradesman, the professional man, and the nobility, are co-existing classes which the customs of the country tend to keep separate and distinct. There is no law against the laborer's son becoming a blacksmith or a baker; there is, however, a custom that demands of the aspirant to the higher calling a money premium for the privilege of becoming an apprentice, which the laborer cannot afford. As a result of this the son follows his father's humble vocation generation after generation. The dental student is required to spend two years out of the four allotted to his professional studies in the laboratory of a registered practitioner. For this privilege he must pay a handsome fee. It is only within recent years that the dental schools of Great Britain have taken this matter in hand, and not all are yet prepared to give a systematic course of instruction in this important branch, as the American dental schools have from the very first. Those that are, make for this a separate and distinct charge. I am not finding fault with the schools on the other side. I recognize that they are doing good work for the community and the profession. They are meeting the conditions which there exist. Nevertheless, the impression is strong that the British curriculum is costly in time and in pounds, shillings, and pence; and that it has been made so that only those within a select circle of the community are able to meet it. The L.D.S. requires not only four years of preparation, but it costs from three to four times as much in tuition fees as does the D.D.S. Why is this?

Why is it that tin-plate cannot be made as cheaply in the United States as in Wales? Simply because the mechanics who make it in Wales are contented to follow the custom of their country, and to simply exist; they are satisfied with a meager wage. The mechanics in the United States, following the customs of *their* country, want to live and enjoy life, and demand more pay. The tariff laws of the United States enable them to do this and retain the trade.

The upbuilding of the tin-plate trade of the United States, and the upbuilding of the professional schools in Great Britain, has been brought about by the same means. It is not a question of quality, but it is a question of expediency. In each case the legal measures that have been taken to uphold the customs of the country have been found effective and satisfactory to the country benefited. Of course the Welshmen complained when their monopoly of this industry was rudely shattered, but, inasmuch as the American people were content to pay a higher price for an inferior quality tin-plate in order to build up their own trade, no heed was paid to them; and you may rest assured that just as long as the dental schools in foreign lands satisfy the home market, they will be considered the standards in the communities they serve, and will have the home field reserved for their exclusive use, regardless of any comparison that may be made with those of other lands. Why should it be otherwise?

It is not my purpose to make any comparison between the curriculum leading to the L.D.S. and that leading to the D.D.S., further than to say that just as soon as those on this side, discontented with the standing of American dental schools, stop stupidly fumbling with almanacs, cease their everlasting counting of days and months, and look up the facts of the case, they may learn how and why the American dental schools have done, with their shorter terms, such excellent work. It is not the time that is spent, but it is the way in which it is spent, that tells the tale.

When our English co-laborers ended the long struggle for legal recognition by placing the organization of the profession in the hands of the General Medical Council, and delegated to that body the task of providing educational standards and educational facilities, the masses of the profession were in nowise a unit as to the wisdom of the course taken. There was much discontent. No heed was paid to this, however. Those who had borne the heat and burden of the fray were satisfied. They had, purposely, taken a step beyond recall, and had placed these matters of vital interest beyond the reach of the howling mob. The schools were secure. Where and how the aspirant for professional recognition should acquire his education became "Hobson's choice." One prolific source of turmoil was effectively quieted. This out of the way, the professional fathers earnestly set to work to reorganize the profession into a compact, thoroughly organized professional brotherhood, with wonderful success. Most earnestly do I ask your attention to the work they accomplished for the profession and for the community. Note, if you please, the large number of practitioners who are members of their national body; the large number of dental hospitals or dental infirmaries, part of the educational system, scattered over the land, doing charity work. Many of these have been organized by dentists who have freely contributed their time, talent, and hard cash. Note, if you please, how now and again the opening of these has been made a social function at which royalty has assisted, and to which the wealthy have contributed thousands of pounds. Note again, if you please, how seldom, how very seldom, complaint appears in the dental journals that these free clinics are "taking the bread and butter out of our mouths." All these things, permit me to suggest, are commendable.

PRACTICAL CONCLUSIONS.

What is most needed in this country by the dental profession is to stop the distracting discontent with our dental schools and our dental educational standards. Follow the example of our friends abroad and pay more attention to the home market and less to the export trade —which, rest assured, has gone forever. Put the well-thumbed almanacs away on a high shelf, or, if you please, where the children and dogs can tear them up. Judge the dental colleges by what they have done for you, for your professional neighbors, and by what their graduates have done to give the profession of our own land the high standing it has. There is room for improvement, undoubtedly—*if the profession will provide the means.* Make it worth while for a talented dentist to accept a professorship in a dental school, and stop the serious loss the profession sustains when promising young teachers, underpaid, are compelled to resign when their practice becomes somewhat remunerative. Teach the community to respect your profession by respecting it yourselves. Do not lower yourselves by proclaiming the shortcomings of the school from which your diploma is dated. There is far too much of this, and it receives far too much encouragement in our dental societies. The colleges are giving us excellent material for the upbuilding of the profession, if it be properly used. The young men are being taught by the older ones to speak slightingly of their teachers and of their schools. Trivial matters are magnified and remembered when they ought to be forgotten. Change the tune. Teach them, as they are taught in England, that the schools are right, the teachers are right, and the curriculum is right, the very best in the world, and that if anything goes wrong it is their own fault. Let the overworked craze for so-called higher education have a rest, and pay more attention to the possibilities of the profession. Make the profession what it should be, and what it can be if properly organized. Stop squabbling and get to work, making the professional societies strong, ambitious, united, up-to-date, and progressive. Make them such that no young man entering the profession can afford to remain outside. Get them in, give them a chance, set them to work. Teach them that this profession of ours is an honorable one, full of possibilities, and one whose worthy members will ever command the respect of the community. This, I take it, is the "higher education" that the dental profession in the United States most needs at the present time.

FAULTY METHODS IN TEACHING AND STUDY.

By GEORGE O. JARVIS, M.D., Philadelphia, Pa.

THIS article owes its existence to difficulties encountered in teaching anatomy to dental students, and anatomy, physiology, pathology, and other branches to graduates of medical schools. The troubles encountered were not always due to laziness or deficient capacity on the part of the student; but could be traced back through the professional to the high and grammar schools, and even to the kindergarten.

By a faulty method is meant a method which fails to produce the result desired. The aim in anatomy, for instance, is to teach — (1) The principles of anatomy, and (2) those details which are essential to enable the practitioner to do the best work with respect both to himself and the patient. This implies that all details have not equal importance. The unimportant details are those not required by the practitioner for frequent use, those which are not essential to the proper understanding of the subject, and those for which one may properly refer to text-books to obtain complete information as occasion arises. In other words, a degree of knowledge of the female pelvic organs needful to a gynecologist would be too much to expect of a man who devotes his whole attention to the oral region; though both should certainly understand the structures and functions of both regions in so far as is essential to treatment of the patient, considered as an anatomic and physiologic unit. Indeed, a high degree of familiarity with one branch of knowledge is to be obtained only at the expense of some other. The object of the individual should be to maintain a proper balance between that which he may desire to learn, as a mental exercise or ornament, and that which he *must* learn to become proficient in his chosen work. The precise balance for each person cannot be decided in an offhand way; but it is entirely evident that there are such things as essential and non-essential information with regard to a given vocation.

A worker needs utilitarian knowledge; that kind which will enable him to produce results of value to himself and others. This balance must, therefore, be struck with an eye always to the use which is to be made of the knowledge. The preliminary work should also be planned with reference to its use. A youth can hardly decide on proper elective studies for himself; yet it seems evident that courses in the lower schools should be planned with some definite end in view. It also seems evident that the following objects should be sought: (1) Thorough grounding in the mother tongue so that it can be used clearly, concisely, and correctly both in speech and writing. (2) That such a knowledge of mathematics should be imparted as to enable the individual readily to perform ordinary calculation; to pursue its further study if occasion demands, and to give that kind of mental training peculiarly to be derived from mathematics. (3) That there should be such groundwork in history, geography, and such matters as will enable the student to understand and appreciate the course of events. (4) If foreign languages be taken up, it is surely better to get a useful working knowledge of one foreign tongue than to have a bare smattering of several of no value either in reading, writing, or speaking—the only apology for taking them up at all being that "it is the correct thing to do." (5) To give such careful mechanical training as the circumstances of the case seem to indicate; and last, but not least—(6) To teach the individual to *think*.

It is a mistake to extend the curriculum to include the less important subjects—less important, that is, with reference to the given case—without the gravest consideration, lest effort be dissipated in multiplicity of endeavor rather than directed to efficient concentration. This statement does not mean that sufficient time shall not be allowed to grasp a broad subject—a fault noticeable in the so-called "concentration plan" too much in vogue in some of our professional schools. In some of these the work is so thoroughly "concentrated" that the student is compelled to pass the principal examination in anatomy at the end of the first year, and this before he has dissected the parts on which he is examined. In one well-known dental school the students do not dissect the head and neck until the second year, having during the first year completed the course in systemic anatomy and been examined in it. In the same school the course in chemistry for both medical and dental students is given at the same time by the same man; both classes receiving practically the same instruction. This course begins on the first of October, and ends before the first of February of the same school year. Many of the students have had no previous chemical instruction, and it is utterly impossible that the average student can take in a proper and reasonable knowledge of chemistry—along with his other work—in such a limited time. The fallacy in an attempt to teach important subjects in too short a time is nailed by an illustration employed by one of our best-known and most successful teachers. He says that if a person fall from a roof to a hot asphalt pavement on a hot summer's day, the pavement will be damaged but little, and the individual much; but that if he stand on the same pavement while the sun shines hotly, he may readily sink in to his ankles.

A high-school course, or its equivalent, is required for admission to all dental and medical schools of good standing, and is certainly necessary to insure that the student will be able to obtain proper benefit from his course. With regard to a college degree opinions differ; some claiming that the intellectual discipline and other goods acquired during four years in college will be exceedingly valuable assets to a professional student. Others object—(1) That it is time and money wasted; (2) that the man had better spend those years molding his mind to his life-work; (3) that the time spent in college would give him a good start in his profession; and (4) that the ordinary college curriculum tends to make a mental dilettante rather than an exact and efficient man of affairs. While the writer possesses a college degree, yet he feels that it is better—if a college course be taken at all—to allow elective work of such character as to be of direct value in professional studies from the beginning of the freshman year; then either to arrange the college work to count as the equivalent of the first year in the professional school, or to leave college for the university at the end of the second or third year. Many institutions have at present some such arrangement, and it seems probable that a similar adjustment is inevitable in all our progressive institutions.

Everyone having to do with students will notice certain bad mental habits; habits which are natural to many, and which the lower schools usually do little to eradicate. These are (1) Lack of thoroughness. (2) Lack of interest. (3) Lack of proper study methods. (4) Lack of clear mental concepts. (5) Lack of concentration.

If it be granted that schools can mold the youth to excellence, then it must also be granted that they have the power to harm the developing individuals. This by no means signifies that school education is not desirable, providing it does educate; only that some kinds of education are better than other kinds. These deficiencies on the part of the student may be correlated with similar faults on the part of the teacher.

(1) Lack of thoroughness in the pupil implies to an extent a similar quality in the teacher. Either the teacher's work is not thorough, or he accepts slipshod work from the pupils, who will usually

slide along the lines of least resistance. If the teacher makes it harder to do poor work than good, an ordinary person will show improvement, if not excellence.

(2) Lack of interest is not confined to the student body, and enthusiasm or its reverse may be trusted to communicate itself from teacher to pupil.

(3) Improper study methods are ordinarily a compound of lack of interest and lack of thoroughness, which originate in the lower schools and run their course through the whole educational system. In the lower schools there are teachers who do not insist that the pupils shall thoroughly master the subjects as far as they go, and who feed the scholars on a kind of predigested mental pap, weakening the mental digestion so that it will never be strong enough to assimilate knowledge in the unprepared state. In a word, everything is made easy, too easy, so easy that mental grasp and effort never reach full development. These and other causes lead to an unsatisfactory start in the subject, which hinders the student in further study. He lacks a good foundation, and consequently learns less rapidly with the same amount of effort than he would otherwise do. This is a sinful waste of time, money, and energy, which can be avoided only by well-rounded work at the very beginning.

If the pupil has a poor start he is forced to skip along somehow without ever properly comprehending the subject in order to "keep up with the class." The habit of leaving everything unlearned or partly learned which is not completely grasped at the first glance, is one hard to break and extremely hurtful in its effects. No person with such poor preparation is fit for professional study, as his mind cannot grasp and hold the broad principles of a subject. It is only fit to receive a certain amount of detail—a measure which soon runs over. Students of this kidney take to quiz-compends like ducks to water. They have never thought in the proper way. All their rooting and grounding work has been done for them, and they don't know how to begin. Such students think quiz-compends will save them work and the painful necessity of thinking for themselves. There are many objections to quiz-compends: (*a*) They give a predigested and concentrated extract of information; so thoroughly predigested as to induce atrophy of the intelligence from disuse; so concentrated as to disturb the mental digestion. The mind, like the stomach, should not receive its pabulum in a predigested and concentrated form. There must be work left to be done on food for either body or mind before it can be properly absorbed and assimilated. (*b*) It is impossible to present a broad view of a subject in the narrow limits of a quiz-compend, and the student who starts to use one very seldom makes proper use of lectures or text-books till he has acquired by much travail a fair knowledge of the subject, or learned by sad experience that he really has not discovered the royal road to learning. Students say and think that compends cover the ground of the lectures, and feel relieved from the necessity of attending them; not realizing that the broad knowledge and ripe experience of the teacher, assisted by pictures, apparatus, and clinical demonstrations—not in the reach of anyone who does not have much time and money to devote to the subject—enable him to present the subject in a new and interesting light. (*c*) Study from a quiz-compend is largely a mere effort to memorize, because there is no room for anything beyond a bare statement of fact. Students need diagrams, pictures, and explanations as pegs on which to hang and arrange the facts presented to them. Unless knowledge is arranged in a coordinate whole, it will be soon forgotten and is practically useless even while retained. The value, for instance, of an anatomic text-book can be judged by the profusion, clearness, and general excellence of its explanations and illustrations. A book of this character must necessarily be quite bulky, occasionally so appalling students by its size that they never attempt to read it. Study in such a book is not by any means as great a task as might be imagined, for the best books are so arranged that the more important paragraphs can be singled out at a glance.

Details and explanatory remarks are in smaller type, to be read as required. Illustrations accompanying the text are absolutely essential to properly appreciate such a subject as anatomy, and their absence is a fatal flaw in a book. The greater ease and rapidity with which the subject can be grasped by aid of good illustrations and explanations more than compensates for the brevity of a quiz-compend, to say nothing of the greater use of the more complete knowledge to be derived from a properly written and illustrated text.

(4) These same faults in study methods prevent the student from ever getting crisp, clear-cut concepts on which the quality of our knowledge largely depends. A sort of mental haze is responsible for many false ideas. No one who does not try to get a crystal-clear idea of that which he would make known, and how it may best be presented, should try to teach. It is surely true that the teacher who has trouble in making a class understand will find that the difficulty lies with himself, not with the students. If such a man will examine himself, he will perceive that those points which he could not make clear to the class were not clear to himself. If they had been it would have required only a very ordinary power of expression to render them intelligible to others. It is doubtless true that most teachers are over-burdened and under-paid, and that too many subjects are included in a limited time, but he should teach his very best if he teach at all; but an attempt to point out broad principles and paint in only such detail as can be done without sacrificing the larger ideas, will improve the quality of knowledge. Try to stimulate the student to work up detail for himself and then to correctly generalize therefrom. It must be admitted that a considerable mass of detail must be presented before the final logical deduction of the principles can be made. Details first, broad principles afterward, is the method by which our knowledge has been built up, and it is necessary that each person should go through this inductive process for himself, so that he may learn how to think and to correlate isolated facts into a co-ordinate whole.

(5) Lack of mental concentration implies that the man does not know how to work. The student who is interested in his work does it thoroughly in the best way he can, and he whose ideas are clear has the power to concentrate. A listless, lukewarm man who does not know what or why he should learn cannot do this. Boys should not be *sent* to a university; they should go because they want that which it offers. Better let a man be a good mechanic than a mediocre doctor. Whatever one is, be that thing. It is desire which renders concentration possible, and without concentration good work is not accomplished. How can a man be earnest to get that which he never desired?

METHOD OF MAKING AN OPEN-FACE CROWN.

By W. E. DIEFFENDERFER, D.D.S., Washington, D. C.

(Clinic at the union meeting of Maryland State Dental Association and District of Columbia Dental Society, at Baltimore, May 25, 1905.)

AFTER preparing the tooth in the usual way, a wire measurement is taken, and an impression of the tooth is made in plaster. (Fig 1.) Cut away from the cast the adjoining teeth, and with a fine-pointed instrument clearly define the gum line. The wire measure is now placed on the cast, and the tooth trimmed as far as it is intended that the band should reach under the gum. Make a die of the whole in Melotte's metal, also a die and counter-die of the posterior aspect of the tooth. A piece of tin foil is cut for a pattern, placed on the lingual surface of the first die (Fig. 2), and burnished into position. The front is then cut out, allowing for an overlap on the cutting edge, and also for a lapping of the band in front. The gold plate is then cut according to the pattern (Fig. 3), and placed on the second die, representing the posterior surface of the tooth. (Fig. 4.) This is held on the cast and partly swaged with a horn mallet to prevent the plate from slipping when placed between the die and counter-die. (Fig. 5.) The swaging between the dies is then finished with a hammer. The back of the crown will now fit accurately, and it should also fit the first die.

FIG. 1.

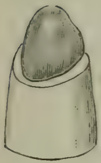


FIG. 2.

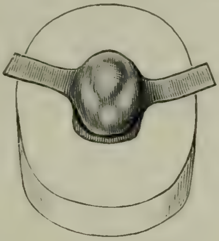


FIG. 3.

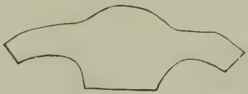
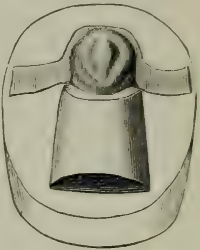


FIG. 4.



The open band is at this stage of the procedure burnished around the front part of the first die, and by holding the back in position with the thumb, it is made to conform accurately to the die. The ends of the band are forged thin where they are to lap, and the place where the band is to be soldered is marked. We now have the back of the band fitting the die accurately, with the overlap and the sides of the crown flaring. The flare is now hammered to place, and the crown should fit the die and the plaster cast perfectly. The opening in front is now cut with a stone on the engine, the band is reinforced with 20-k. solder, and the crown is finished in the ordinary way. (Fig. 6.)

FIG. 5.

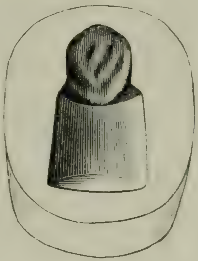
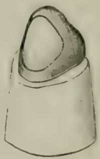


FIG. 6.



PARALLELOGRAM AND POLYGON OF FORCES SHOWING THE FACTORS INVOLVED IN THE MAINTENANCE AND OVERTHROW OF THE ARTICULAR EQUILIBRIUM OF THE TEETH IN THE DENTAL ARCHES.

By Dr. CHARLES GODON,
DIRECTOR OF THE ÉCOLE DENTAIRE, PARIS, FRANCE.

L'*ODONTOLOGIE,* in its issues for December 15 and 30, 1905, published our recent studies of the mechanism of the jaws and the conditions required for the maintenance of articular equilibrium of the teeth.

We have presented during the current year, before the Paris Society of Odontology at the January meeting and before the American Dental Club of Paris at its February meeting, four diagrams which we believe constitute a useful addition to our contribution on the forces involved in the maintenance and cessation of the articular equilibrium of the teeth. (See Figs. 1–4.)

Fig. 1 represents that part of the dental arches that we have selected as a bench-mark in our communication. It comprises the lower and upper first molars in normal occlusion; the slight space between the occlusal surfaces is for the purpose of facilitating a better understanding of the question.

To demonstrate that the lower first molar, taken as an example, is in a state of perfect equilibrium, we draw a series of parallelograms, together with the lines showing the direction of the forces contributing to that equilibrium, and we obtain resultants which are the diagonals of those parallelograms. Thus the lines C′ O and D′ O, which represent the forces acting upon the mesial and distal surfaces of the root of the tooth, enable us to draw the parallelogram A C′ O D′, whose diagonal, A O, is the resultant of the forces acting upon the whole root of the tooth.

In a similar way the lines B′ O and B″ O, which represent the forces acting upon the occlusal surface of the tooth, enable us to draw the parallelogram B B′ O B″ whose diagonal, B O, is the resultant of the forces pressing upon the occlusal face of the tooth—that is, the dental inter-articulation. These two opposite resultants, A O and B O, annul one another.

If we consider the forces acting upon the approximal surfaces of the teeth, B′ O C′ O and B″ O D′ O, we can in the same way draw the two parallelograms C B′ O C′ and D B″ O D′, whose diagonals, C O and D O, are the resultants of the forces acting upon the approximal surfaces.

Thus the different forces pressing upon the different surfaces of the tooth considered mesio-distally can be reduced to the four resultants A O, B O, C O, D O, which are the diagonals of the parallelogram A C B D and constitute a closed polygon. All these resultants annulling each other, the body remains in perfect equilibrium.

If we now assume that the two teeth which constitute the dental inter-arch articulation of the tooth have been lost, either partially by decay or entirely by extraction, and that consequently the forces usually pressing upon the occlusal surface have ceased to exist, the polygon A C B D will be open at B′ O B″ and the equilibrium will be lost; for the resultant of the acting forces is the diagonal A O, which will force the tooth in the direction of A O. (See Fig. 2.)

Let us consider another case in which the next tooth mesially has disappeared partially through caries or entirely by extraction, and where complete restoration has not been made.

FIG. 1.

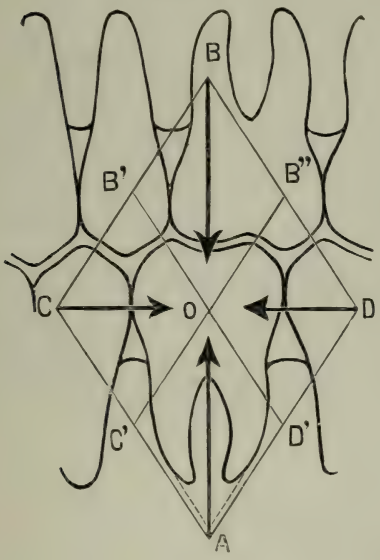


FIG. 2.

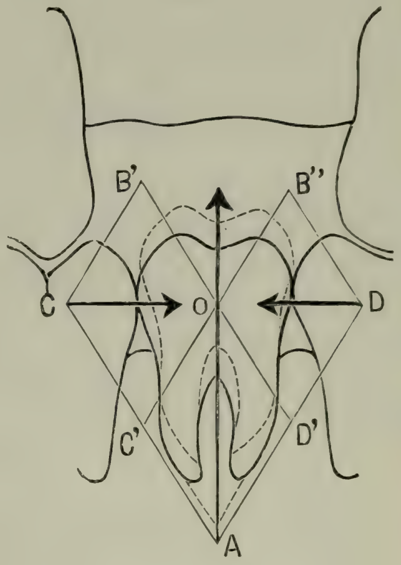


FIG. 3.

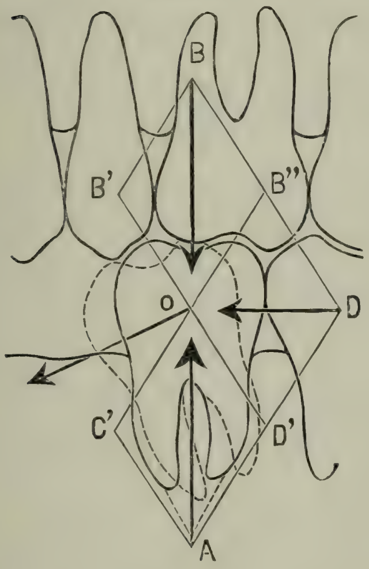
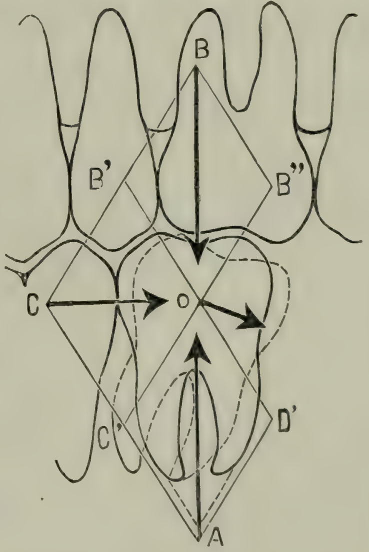


FIG. 4.



The forces which were applied upon the mesial side exist no longer; the polygon A C B D is open at B′ O C′ and the equilibrium is broken from the mesial side; for the resultant of the acting forces is the prolonged diagonal D O, and the tooth is thus made to rotate upon the mesial aspect of the alveolo-dental articulation—its point of support. (See Fig. 3.)

Lastly, let us consider a third case in

which the next tooth distally has disappeared under similar conditions. The forces previously acting upon the distal surface exist no longer. The polygon A C B D is open at B″ O D′ and the equilibrium is broken on the distal side; for the resultant of the acting forces is the prolonged diagonal C O, the tooth thus being made to rotate upon the distal part of the subsisting alveolo-dental articulation as its point of support. (See Fig. 4.)

As we mentioned at the beginning of this communication, we did not think it necessary to describe the different mathematical and mechanical calculations needed for the construction of the polygon of forces, only desiring to present in a short though sufficiently clear manner merely the conclusions which we have reached from our previous studies.

It is interesting to note that the four diagrams here presented, which conform to the laws of mechanics, are substantiated by clinical observation, as they fulfill the conditions necessary for the maintenance of equilibrium and those involved during the cessation thereof.

Finally the polygon of forces that we have conceived and applied in the mesiodistal direction of the tooth can be similarly applied in the linguo-buccal direction. In the first case the approximal forces are represented by adjoining teeth, while in the latter they are produced by the tongue and cheeks.

Of course the parallelograms and polygon of forces can be applied to all the teeth of the jaw, although it is a little more complicated in the case of the anterior teeth because of the overbite and of the absence of occlusal groove.

CORRESPONDENCE.

UNION MEETING OF SOUTH GERMAN AND SWISS DENTISTS.

To the Editor of the Dental Cosmos:

Dear Sir,—The South German and Swiss dentists (Zahnärzte) united in the celebration of the forty-third anniversary meeting of the Frankfort Association of Zahnärzte in the halls of the Old Lenckenberg Museum at Frankfort-on-Main, April 27, 28, and 29, 1906. The affair made quite a stir in old Frankfort, and was the largest of its kind ever undertaken here. The guests and their families were entertained at hotels, cafés, and theatres, and were driven about the city, while the dentists heard prominent college men lecture during three consecutive days continuously.

American and other foreign school graduates who are not holders of the German diploma, by a strict interpretation of the statutes, were not permitted to attend the meeting. As a fact, the leading demonstrations at the meeting were made by German-American graduates of American colleges who also possess German college diplomas.

The lectures and demonstrations were as follows:

William Herbst, D.D.S., Bremen: "Experiences with Crown Cap Bridges and Temporary Fillings." "Platinum Gold Foils in Mechanical Dentistry."

Prof. Dr. Adolph Witzel, Bonn University: "The Modern Treatment of Pulps and Diseased Roots of Teeth. Indications for Root-apex Amputation and Trephining of the Alveolus."

Prof. Dr. Port, Heidelberg: "Diseases of the Maxilla and Their Treatment."

Prof. D. Römer, Strasburg: "Tumors of the Jaw."

Prof. Dr. Heitmüller, Göttingen: "Exostosis of the Jaw-bones, with Demonstrations."

Prof. Dr. Brandt, Berlin: "Additions to Oral Surgery."

Prof. Dr. Peckert, Heidelberg: "Articulation."

H. Addicks, D.D.S., Hanover: "Crown and Bridge Clinic."

Emil Herbst, D.D.S., Bremen: "Active and Non-Active Regulating Appliances."

Alfred Körbitz, Berlin: "Diagnosis and Therapy of Irregular Bite."

Wolpe Offenbach: "Treatment of Irregularities."

W. Pfaff, Dresden: "Orthodontia."

C. Heydenhauss: "New System of Regulating Teeth."

Dr.-Med. Kleinsorgen, Elberfeld: "Clinical Pictures of the Teeth."

Prof. Dr. Miller of Berlin: "Examinations as to the Causes of Hatchet-Form Defects."

Prof. Dr. Michel, Würzburg: "Topography of the Alveolar Regions."

Dr. Morgenstein, Strasburg: "Experiments with Ferric Medicaments upon the Teeth."

Anton Witzel, Wiesbaden: "Dry Treatment in Diseases of the Teeth."

Julius Steinkamm, Essen: "Dentinal Anesthetics."

Dr.-Med. Euler, Heidelberg: "Local Anesthetics and Narcotics."

Dr. Schaeffer-Stuckert: "Injections in Local Anesthesia."

Many of the demonstrations were made by means of a powerful stereopticon. In a separate hall were housed about five hundred exhibits of matters pertaining to prosthetic dentistry.

WISTAR P. BROWN, D.D.S.

FRANKFORT-ON-M., April 30, 1906

PROCEEDINGS OF SOCIETIES.

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Thirty-seventh Annual Union Convention.

THE thirty-seventh annual union meeting of the Seventh and Eighth District Dental Societies of the State of New York was held in the Assembly Rooms of the Chamber of Commerce, Rochester, N. Y., October 31 and November 1 and 2, 1905.

The meeting was called to order at 2 P.M. on Tuesday, October 31st, by Dr. C. C. Bachman, Waterloo, president of the Seventh District Society.

Dr. C. W. LaSalle, Rochester, secretary, took the chair while the President read his annual address.

The next order of business was the reading of a paper by Dr. WM. H. TRUEMAN, Philadelphia, Pa., on "Dental Education from a New Standpoint."

Dr. Trueman not being present, the secretary, Dr. LaSalle, read the paper [as printed in full at page 739 of the present issue of the COSMOS].

Discussion.

Dr. J. Q. BYRAM, Indianapolis, Ind. I believe Dr. Trueman has struck the keynote when he says that we have been catering in the last few years to the European market for students; that we have been wanting to bring our standard up to what they consider it should be. I have had some experience in college work, and to my mind the great trouble with the European profession is that they are jealous of the American profession. It is not because they are better dentists, for they are neither better educated in dentistry nor as skilled as we, and it is the mere fact that we excel them that makes them jealous. And what is the result? In Germany at the present time they are endeavoring to enact legislation that would make it impossible for the American dentist to enter into practice there. Why? Because they realize that American dentistry is excelling. I know of young men, graduates of American colleges, located in most European countries, who are all succeeding. I have in mind at this time two young men who were in 1900 graduated from the institution with which I am connected, and who are now practicing in Europe. One was fortunate enough to marry the sister of a dentist, and he is well cared for in the sense that he can practice with his brother-in-law. The other is with Dr. Mitchell of London, and is now working for the L.D.S. degree. That young man cannot practice independently until he acquires the L.D.S. degree, but as far as his skill is concerned, I believe he is the equal of any dentist in London.

It is jealousy to a great extent that is causing this difficulty in Europe, and Dr. Trueman is right when he says "Let us look to America for our students; let us show the profession here that we are doing good work in our colleges." I grant you that our standards are probably not as high as they should be, but they are practically as high as those of other professions. Can you expect us to have a higher standard than the other professions, and have young men enter ours? No. And I wish to leave one thought with you which is not included in the paper, and that is, that we are all clamoring for higher preliminary educational requirements. Did you ever stop to think that we have placed the cart before the horse? Now, what is the result? You may investigate the catalogs of the different dental colleges of the United States, and you will find that less than ten per cent. of the students are holders of the A.B. degree or its equivalent. Why? The man who has the A.B. degree can enter the medical profession, or any scientific school, and obtain a year's credit for his degree, but if he enters a dental college he must drag along for three years, just the same as the man who has the minimum requirement. I have contended for years that the only way to conduct our educational institutions is upon the credit basis. If one student can cover the curriculum in an institution in two years, while it takes another three, let him do it, thereby encouraging educated men to enter our profession. But as long as we require the educated man to drag along with the men who have the minimum requirement, we may expect them to enter the other professions in preference to dentistry. I have had some experience in teaching young men. I have been at it for about nine years, and I have observed that the young man who comes with the A.B. degree or its equivalent, does not make as proficient a man as he would have made if he had been required to work harder. Why? The young man with the A.B. degree is placed on the same footing as are the men who have the minimum requirement, and the latter are forced to study very hard, while the former is not. The result is that he fulfills the requirements in less time than the other man, and his extra time is not provided for by the curriculum. All the students who have entered our school on advanced standing from schools of medicine or pharmacy and have been graduated in two years, were the leading men in their respective classes, because they had to work diligently in order to accomplish in two years that for which the ordinary student had three years at his disposal.

Dr. C. W. LaSalle, Rochester. Those of you who were at the spring meeting of our society may remember that I had something to say in a paper at that time concerning preliminary education. Dr. Byram has taken the opposite stand from that which I took in that paper, to the effect that the man with a high preliminary education has a mind better able to grasp the subject than the one who has not. While I cannot confess to the experience that Dr. Byram has had, I have been able to observe among my classmates the comparative nimbleness of mind possessed by the men with a high preliminary education. They are also more receptive mentally than the men who have such a preliminary education as is obtained in the public schools, graduating at fifteen or sixteen years, and then occupying themselves in some pursuit up to the time when they begin the study of dentistry. I suppose Dr. Byram's argument would hold good in the case of men who are graduated in the same period as the highly educated men are. It has been my experience, however, that it is very difficult for men who pursue scientific subjects, or for medically educated ones, in whom a different line of thought has been engendered and who have lived in a different atmosphere, to grasp our own methods of thoughts. It seems to me that the higher preliminary education is desirable, in a measure at any rate, but the preliminary education that I spoke of at the time of reading the paper referred to was the special education that would fit a man to take up dentistry and do work at the chair. The man coming from a trade or a salaried position has to learn first of all how to study, and at the time I read the paper I meant by preliminary education a knowledge of elementary chemistry, a sufficient knowledge of Latin to enable him to grasp the scientific nomenclature, and such a knowledge of ethics as would raise the man to an appreciation of professional conduct, and of his importance as a social factor. That was the idea I had in mind when I spoke of preliminary education. I do not, however, think that this would enable him to start in the second year with the full course that the colleges are now giving.

As far as our own market is concerned, I think we have enough to do here to take care of it.

Dr. Byram. I did not mean to cause the impression that the man with the higher preliminary education did not make a good student, but I did intend to give the impression that such a candidate would make a better student. I contend as you do that men who come from a trade or store, or from the farm, are fortunate if they have a high-school diploma, and many probably have not its equivalent. Many have but the minimum requirement, and the result is that it takes them nearly a year to learn how to study. The other man knows how to study, and grasps the subject in less time, and if carried through in two years would come out a better and stronger man. My point is that we are not encouraging the educated men to come into our profession, but are rather discouraging them.

Dr. H. J. Burkhart, Batavia. I heard only the last few sentences of the paper, so I am not in position to discuss it, but I want to take issue with the statement of Dr. Byram with reference to what he called jealousy on the part of the European practitioners in shutting out, or attempting to shut out, American practitioners. The trouble in Germany has arisen from the well-known fact that we have had in the past any number of discreditable schools and diploma mills that have been dumping their illegal and unlicensed graduates on the European market, and that of itself has had more to do with discrediting the D.D.S. degree there than anything else. I have been for several years on the committee of the National Dental Association to superintend the expenditure of the fund for the prosecution of these diploma mills. The National Dental Association and one or two other bodies have expended several thousands of dollars in running down one or two colleges in Illinois and one in Wisconsin, and I think the work done in ridding the country of these institutions that have been an eyesore and a stench in the nostrils of every decent practitioner is just beginning to be appreciated by the profession. Our principal complaint came from Germany, and it was due to the efforts of Dr. J. H. Worman, consul-general at Munich, that we were placed in possession of evidence which sent one or two men to the penitentiary in Illinois, and which chased others outside of the jurisdiction of the courts. I have been in favor of taking up the matter of recognition of the D.D.S. degree through diplomatic channels, to see if it were not possible to bring about an understanding along governmental lines or channels for the proper recognition of the D.D.S. degree, so that those who are now engaged in practice, not only in Germany, but in England, where our degree is also under the ban today, may become legalized practitioners. The principal objection to the recognition of the D.D.S. degree in some countries has been that we did not require the same educational qualifications for admission to our schools as are necessary in the best schools abroad. For some years I have been giving more or less attention to the question of preliminary education and its effect upon practitioners, and during my eight years' experience as a member of the New York State Examining Board I have been watching the upward progress of the preliminary requirements in this state from practically nothing to forty-eight academic counts. I have observed the marked improvement, not only in the practical work, but also in the theoretical branches. I have also noticed the improvement in the examination papers of today, nearly all of which are couched in good English, are legible, and the spelling in which is such that at a glance we know what the men mean instead of having to spend hours deciphering poor papers, as we had to do years ago. All of this in my judgment has tended to lift up and improve the standard of dentistry in this state. I would go as far as anyone in allowing the student credit for whatever he is entitled to on account of any prior work he may have done, but the great difficulty in adopting that plan lies in the well-known fact that there is practically no standard to go by, and no authority outside the department of Education in the state of New York that is reliable and trustworthy. We have noticed the National Association of Dental Faculties shifting from one proposition to another. One year a certain standard is adopted and the next year, because there happens to be a majority of schools that may have been affected financially or otherwise, they reverse their decision, and so they have become the laughing-stock of the thinking men in the dental profession today. If we had a national body with sufficient authority to enforce its rules and edicts, it would be very easy sailing, but so long as but few colleges out of about sixty in this country are not proprietary institutions, whose policies are largely shaped by the amount of revenue derived from students matriculating and graduating, you will have much difficulty in accomplishing anything very tangible.

My experience leads me to believe—and I think it is in line with the experience of every member of the Examining Board—that the greatest fault today with college education is in the amount of practical work which the student is required to do. I go back seventeen or eighteen years to the time when I was in college, and I find, from coming in contact with the students of the present day, that there is very little difference in that respect between now and then. They are hustled out of the laboratory, then through the infirmary, and as far as can be done so decently the students are graduated and put on the market. Some colleges require a certain number of fillings of various kinds; others require a certain amount of mechanical work, but while that is religiously lived up to and insisted upon in a few schools, in a very large majority it is not. Many of the students who come before us today I take aside at examination time and ask how much time they have devoted to practical work, and how long they have been preparing to go before the examiner. I find in a majority of cases that the whole lot has been cramming and has been worked on by demonstrators to get ready for the final test. If you will speak with the newer graduates, nearly every one will tell you that he had rather go into the office of another practitioner than to sail out for himself, and it is simply because he has not had the practical experience necessary to fit him for his work.

I believe if the profession were to get together, stand back of the colleges, and insist that at least the last year of the college course should be devoted largely or entirely to practical work and to keeping an accurate record of the practical work which is done, we would have a very, very much higher percentage of good, reliable practitioners. There is a movement on foot, which has received the sanction of the New York State Dental Society, that at the end of the second year the students in the colleges may be examined in what are known as the theoretical branches: anatomy, chemistry, physiology, etc., and that the last year of their course, after these branches have been passed, shall be devoted to practical work; but as it has been before us for a short time only, I am not as yet fully convinced of its wisdom. I am willing, however, that the experiment be tried, to see if we cannot succeed in having the schools teach the best character of practical work, such as the students will have to perform in active practice, and give them something tangible, something practical, something that will always stand in good stead for the money which they have paid in tuition fees to the colleges.

The subject was passed, and the next order of business was the reading of a paper by Dr. C. J. Barber, Auburn, N. Y., on "Some Attachments for Crowns and Bridges," as follows:

Some Attachments for Crowns and Bridges.

The system to be explained utilizes the How screw post and the anchor screw rod, and is applicable to places too fine for the "AA" How post. The first case described is that of a lateral incisor in a lady well advanced in years. The root had supported a plain dowel crown, which protruded extensively, owing to the disintegration of the cement. The lingual side of the root had decayed considerably under the gum margin, and the labial side was so short that had the crown been left off the root a few days the gum would have closed completely over the external surface of the latter. The bite was close, as all of the anterior teeth had abraded to an extent requiring rebuilding of the incisal edges with gold. No posterior teeth were present except the two lower right bicuspids and the upper right third molar. After the old crown was removed, the gum was crowded back as much as possible by means of cotton tents. The root was then explored. A perforation was discovered through the side of the root at the end of the pin, as the operator who inserted the original crown had accidentally drilled almost through the wall of the root-canal. After finding the entrance to the root-canal, it was opened up successfully by means of a spear-pointed drill to a depth sufficient to secure a firm anchorage for a "B" How post. The edges of the root were then slightly trimmed, and a copper band, broad enough to reach just below the margin of the gum, was adapted to the root. The root-canal was enlarged with a "B" twist drill, and dehydrated with alcohol, and the electric hot-air syringe. The opening in the side of the root was now closed with a layer of gutta-percha, the root-canal was tapped, a "B" post was inserted—after having previously covered the gutta-percha patch with cement—and the post was clipped off to the desired length. The copper band was then adjusted, the root was dried with alcohol and hot air again, and filled with amalgam. The patient was then dismissed for a few days to allow the amalgam to harden thoroughly.

At the next appointment the copper band was cut off and the amalgam shaped to receive a platinum cap. Having now a solid foundation, I proceeded to make the crown as follows:

I first struck up a platinum cap and perforated it to admit the screw post. On this cap I soldered a very narrow platinum band of the same diameter as that of the hole; outside of this another platinum band was attached, large enough to admit a "B" nut, and wide enough to articulate with the lower teeth. On this base I soldered a porcelain facing, and then finished the crown by baking on S. S. White high-fusing porcelain to contour.

The crown is cemented and bolted to place, the nut being driven hard down into the cement by means of a "B" driver. When the cement has set, some of it may be removed from the end of the tube, and the tube closed with a porcelain inlay or filled with gold. I have made this crown with a gold cap, backing the facing with thin platinum and filling in with gold instead of porcelain, for about ten years, and have met with but one failure. This one was put on in March 1899, and lasted about five years, when the root split. It had been made for a man who subjected it to hard usage, and furthermore the root which supported it, a left central, was badly necrosed, and the seat of a chronic abscess.

In the case of the patient with abraded teeth, in whom the masticating function was carried on mainly by the anterior teeth, the remaining posterior teeth—the upper right third molar, and the two lower bicuspids—were used as abutments for a bridge. I recommended a bridge and commenced work on the canine. As the pulp was completely calcified in the crown, I had no trouble in grinding the tooth almost level with the gum. When the root was shaped satisfactorily, a platinum cap was made, through which were bored two holes to correspond with two others drilled into the root on either side of the pulp. For this attachment I used the "AA" size post. When the cap was accurately burnished to place, the holes through the cap and in the root were reamed out with an "AA" twist drill, the cap taken off, the root dried, and two "AA" posts inserted in the holes. Around the holes in the cap were soldered two narrow platinum bands, size of the "AA" screws, and outside of these two more bands, large enough to admit of the "AA" nut, and long enough to occlude with the lower teeth. A facing was then backed with thin platinum, soldered to this base, and porcelain was baked above the facing to cover the band on the outside. The crown was then completed with 20-k. solder. The remainder of the bridge was then made in the ordinary way, the several sections soldered together, and the completed piece was cemented to place, at the same time driving down two "AA" nuts on the posts.

The next case was one demanding an upper left bridge, consisting of two bicuspid dummies. Here were a sound canine, a live first molar filled with amalgam, and a second molar decayed under the gum on the distal surface. The gum around this tooth was congested, and the posterior buccal root was partially necrosed, with the apex protruding through the gum. The treatment of the second molar was first undertaken. The cavity was well drilled out and the anterior buccal and lingual roots were thoroughly cleaned, sterilized, and filled. The posterior buccal root was amputated close to the crown. Then the tooth was shortened, trimmed, and the cavity filled with amalgam. When the gum had been restored to a normal condition we had secured a good molar for one of the abutments, notwithstanding the absence of one of its roots. A gold crown was made for this tooth and one for the first molar. As I wished to make this bridge as substantial as possible, on account of the strain which would be placed upon it, I decided, if it were at all possible, to fasten the anterior end to the canine. The canine was perfectly sound, and we did not consequently wish to mutilate its shape or disfigure its appearance by the exposure of gold.

After some little study, it occurred to me that a plate could be bolted to the lingual surface of the canine. The articulation was normal, but just anterior to the center on the lingual surface there was a spot opposite the V-shaped space, between the incisal edges of the lower lateral and canine, large enough to admit an "AA" nut. At this place a hole was drilled through the enamel for such a post.

The enamel was then ground off at the point struck by the lower teeth to allow for a plate of about 28 gage. A piece of platinum was then swaged to cover the lingual surface, a hole was punched through it to correspond with the hole in the tooth, both were reamed with an "AA" twist drill, and the hole was jacketed with a platinum tube of a size to correspond to an "AA" nut. This bearing was stiffened with iridio-platinum plate and 22-k. solder. On bolting this to the canine we obtained a perfectly solid attachment that did not show in the least. An impression was then taken with the molar crowns and canine attachment in place. The bicuspid dummies were prepared, and all the sections were soldered together, thus finishing the piece.

The next case I shall describe is one in which the novel feature—or at least novel to me—is that which might be termed a "three-legged crown." The gum in this mouth showed evidences of incipient pyorrhea, the crowns of the teeth were long, the roots short, and the teeth generally were loosening. Something had to be done at once to prevent further loosening, if the teeth were to be saved for any length of time. To keep within the limits of the subject of my paper, I shall go into the details of treatment as regards the bridge work only. On the right side there were a sound upper third molar, a gold crown on the second molar, and a bridge, consisting of a gold crown on the second bicuspid, a dummy first bicuspid, and an open-face crown on the canine. The bridge had become loosened, leaving the entire strain on the bicuspid root, which was of course rapidly becoming useless. On examining the crown on the first molar I found the root decayed under the crown, so that upon its removal there remained only the three roots. To have this side absolutely firm, I decided to make a solid bridge from the third molar to the canine, using the three roots of the second molar as support for a crown.

These roots were trimmed, a gold cap, reaching under the gum, was made for each individual root, and an impression of the surfaces of the caps was taken with impression composition. In the buccal roots (which were small) pieces of gold anchor screw rod, No. 9, and in the lingual root an "AA" How post, were inserted. Holes were pierced in the three caps to admit the screws, and the caps were put in place. For trial purposes the caps were bolted to place by using Bryant's bridge-repair nuts on the No. 9 posts, and an "AA" nut on the How post. A plaster impression was made of the end of the form which had been pressed against the caps in place. From this a plaster cast was made, which was shaped and fitted against the caps, and from the latter a die was prepared, over which a platinum cap was struck, which was to serve as a base for the crown. Three holes were made in this for the screws to pass through, the cap was fitted to place, and subsequently removed. An impression was then taken with the caps in place, a cast poured, and the base soldered to the caps.

After polishing, the base was cemented to the roots, driving the nuts down on the posts. We now had an illustration of the saying that "In union there is strength," for singly the roots were quite shaky, but all united as they were in this case, it was surprising what a firm foundation was thus obtained. A gold crown was made for this base, a porcelain-face crown for the second bicuspid, a band for the third molar, and all were united into one piece, which when cemented into place, was absolutely immovable.

Discussion.

Dr. F. M. Rood, Rochester. My first criticism of the essayist's paper is that he could have forced the gum from the tooth more successfully with gutta-percha than with the cotton tents. My experience with the How screw post is limited, but I think in the case under consideration, after forcing the gum away as much as desired, I would have placed in the root-canal a No. 0 or No. 1 one-quarter inch brass screw, and around the root a copper band, after which I would have packed amalgam around the screw; at the next sitting I would have drilled through the brass screw in order to gain support for the pin in the crown, and I would have had a very strong root. After removing the copper band, if considered necessary, a new band for additional support to the tooth may be made.

The next difference in procedure between the essayist and myself is in the process of making the bridge in the second case which he described. For instance, in saving the roots of the second molar in the presence of a good first molar for a bridge abutment, it seems to me that the essayist took special pains and spent much time in attempting to save roots that were useless. Now, with a molar in front, which would have made excellent anchorage, I should have extracted these roots and used the other molar for the abutment, and by so doing would have felt sure that I had rendered the patient a better service by eliminating the possibility of future trouble, always likely to follow when roots of that character are present in the mouth.

One unsafe feature in the making of bridges, particularly those extending from the first or second molar to the canine, is the attachment on the canine, which should be accomplished without destroying the appearance of the latter, but which, however, should support the bridge in a substantial manner. If the essayist can drill into the side of the pulp-chamber, and make an anchorage with the two screws which he places in the canine without interfering with the articulation, he has accomplished something that we will all appreciate. We resort to the open-face crown, the full crown, the half-banded crown, and all other methods of that class for the attachment to the canine. The only feasible plan I have ever seen for an attachment in these cases not requiring the mutilation of the crown of the tooth consists in devitalizing the pulp, and adapting to the root-canal a post at the external end of which a small piece of gold is soldered, which subsequently is burnished to the lingual surface of the tooth. Care should be exercised to prevent the post from interfering with the articulation; then proceed as you naturally would with an ordinary bridge.

One point in this work that is a little off the subject, but which, however, is a great factor in a case of this character, and that is the articulation. The inner cusps of the two bicuspids must be the ones to strike the hardest, otherwise the leverage on the two buccal cusps will throw the canine out of position. I dare say that we have all seen the result of that condition. I have seen cases of that kind in my own practice of which I was literally ashamed. Now, if the essayist can prevent the death of that pulp in the canine, he has accomplished something we all appreciate, because I think it is one of the most valuable teeth for preserving the expression of the face.

One question I would like to ask Dr. Barber regarding the metal of the How screw post. I do not know exactly of what constituents they are made, but I have thought that they were made of a combination of silver and some other metal, possibly platinum. In the methods of attachment which the essayist has brought forth, I would prefer instead of a silver combination an iridio-platinum alloy, something unusually stiff, as I believe it would hold the screw much firmer, and also because I think it is more practical.

Dr. BARBER. The crown metal is made of gold and platinum, which is much stronger than the silver and platinum combination. Furthermore, it has over the silver combination the advantage that it does not tarnish.

Dr. ROOD. Referring to the last case, Dr. Barber said that he found on the left side two lower bicuspids that were useless, but that by constructing a bridge he could restore that side of the mouth for masticating purposes. We have all found that bicuspids which have not been in use are so far protruded that it is a difficult matter to restore them to a healthy condition and correct articulation. The essayist said nothing with regard to this point, and his practice is not in accord with my experience along this line. A bicuspid facing can be prepared by backing and tipping the cutting edges of a well-selected facing of proper shape, length, and color. The articulating surface is made of gold swaged over a bicuspid die-cusp filled solid.

Dr. BARBER. As to the first point of which Dr. Rood spoke, that of putting a brass screw into the root of the tooth, I do not know that I exactly understand the manner in which he does it. Had he attempted it in the case of which I spoke, he would have met with the same success as the operator who, in inserting the original crown, drilled through the side of the root, unless he took great precaution to follow the pulp-canal, because the end of the root was well under the gum and the canal almost impossible to discern. I could only detect a faint spot with the aid of the electric mouth-lamp. The pulp of the tooth was calcified, and I had to work very carefully in order to follow the canal, and to keep from drilling through the side of the root. This way of inserting the brass screw into the root-canal may be better than mine, but I do not understand how he does it. Had he inserted a screw into that root without first exploring it, he would have perforated the root before drilling to any considerable distance.

I spoke of forcing the gum back with cotton or gutta-percha tents. I nearly always take several sittings to do this. Sometimes it is done at one sitting, but it is as a rule a difficult task, because the gum, bleeding continually, is usually very tender, and under those circumstances it is a difficult matter to adjust a band into which amalgam is to be packed, for it is not possible to keep the end of the root perfectly dry. If done properly, however, it makes a good piece of work.

With regard to the attachment for the canine without destroying the pulp not being a practical method, I can only say that I have done it, and that I have proved clinically the practicability of the method. I place a cap on the lingual side of the canine, and grind the enamel before drilling the holes, as one cannot cut a thread in the enamel. As described in the second case in my paper, I drill on either side of the pulp. I did not drill very far, but still far enough to hold the little screws, which are there to stay, and there has been no irritation following the insertion of the piece.

Dr. Barber then showed several models illustrating the work described in the paper.

Dr. Barber's paper was passed, and the next order of business was the reading of a paper by Dr. J. J. CANTWELL, Buffalo, N. Y., on "Pressure Anesthesia," as follows:

PRESSURE ANESTHESIA.

The removal of a living pulp is generally accomplished by one of two methods, the application of arsenous oxid, or the anesthetizing of the pulp with cocain. The use of arsenous oxid has become so nearly obsolete, recourse being had to it only in cases where for some reason or other cocainization is an impossibility, that on account of lack of time it will not be considered in this paper.

Two things must be guarded against after the pulp is exposed: (1) Forcing micro-organisms with the anesthetic through the end of the root, or sometimes through the approximal sides into the tissues, and (2) forcing the anesthetic itself so far that it would pass the confines of the end of the root. Such conditions having been obviated, a much more favorable outlook for the comfort of the patient for the next few days can be guaranteed than where the anesthetic has been carried into the periapical region.

In case a portion of one of the walls is missing it is replaced artificially with soft gutta-percha, so that the pressure of the rubber can be made directly against the pulp without danger of the fluid finding an outlet in some other direction; under such conditions an application of pressure lasting only from five to twenty seconds will produce profound anesthesia of the entire contents of the pulp-canals, while the prolongation of pressure brings with it the liability of forcing the medicament through the apical foramen.

The anesthetic is placed in the pulp-chamber, a piece of pink rubber is placed over it, and by means of a ball-pointed burnisher begin with a very little pressure, gradually increasing the pressure. In this way a degree of pressure equivalent to several hundred pounds to the square inch can be obtained. If sensation should persist in the pulp-chamber, the operation may be repeated.

The bothersome post-operative hemorrhage may be overcome in a great number of cases by the use of adrenalin, this being used as the vehicle in which to dissolve the cocain crystals.

Some rules have been laid down for the successful application of cocain pressure anesthesia. All rules governing the performance of aseptic operations must be strictly observed: The rubber dam should be adjusted and the cavity thoroughly dried and disinfected; all instruments should be sterilized and only fresh solutions of cocain are to be employed; no more of the anesthetic solution should be used than is necessary to make the operation painless, either a weak solution or the equivalent dose in a stronger one being used. With proper care and observance of these rules, the time required to anesthetize the pulp thoroughly probably will not exceed one minute.

The automatic obtunder, of which there are several on the market, is perhaps the most perfect instrument made for the anesthetization of teeth prior to the removal of the pulp. Anesthesia by means of the instrument is obtained by forcing a minute quantity of an anesthetic solution through the tubuli of the dentin.

A disadvantage accompanying the removal of pulps under pressure anesthesia by cocain lies in the possibility that we may so thoroughly anesthetize the apical area as to cause the loss of the sense guide when removing the pulp with the broach. It would be an easy matter under such circumstances to force the broach in some teeth into the apical region, thereby causing much injury, especially if the broach be infected.

Discussion.

Dr. B. S. Hert, Rochester. As stated in the paper, for many years the method generally employed for the removal of the pulp has consisted in the application of arsenic for a longer or shorter period of time. This usually destroyed the life of the pulp, after which it could be removed without pain. Some six or seven years ago someone devised a method of forcing cocain into the pulp to produce anesthesia of that organ preparatory to its removal. The latter method has with me entirely superseded the former, but from what I can learn, however, quite a number of dentists still use arsenic, a method as yet by no means obsolete. I first apply the rubber dam wherever possible, then wash the cavity, and where an exposure may be expected, with a few cuts of a sharp excavator I expose the pulp. If the pulp bleeds even slightly it is exposed sufficiently for the purpose of using this method. A small pledget of cotton is saturated with a solution of cocain in water. This is placed over the exposure and with the use of soft rubber pressure is applied. The essayist speaks of pink rubber for this purpose. I do not know whether it is superior to any other kind, but I use the black or red rubber, as I think that the pink variety is rather hard and unyielding. In applying the pressure I use flat-headed instruments, with which I think I confine the solution better than with the round-headed instruments. A short time after the pressure is applied anesthesia is produced, when the pulp can be removed. I have never limited myself to any amount of time to produce the anesthesia, but the essayist seems to think that there is danger from continuing the application too long. The only condition that I can see could result from the pressure being continued too long or longer than necessary to anesthetize the pulp, would be that the tissues around the tooth would also be anesthetized. However, we know that after a short while the pulp will become quite sensitive again, and it is natural to suppose that the same would occur in the periapical tissues, and no harm would result.

From micro-organisms there is certainly much danger, and everything should be done in an aseptic manner. All the instruments and the solutions should be used with every precaution to prevent the entrance of micro-organisms. I have often wondered if in a pulp that is slightly disorganized, it is not possible to carry infectious material beyond the apex by the pressure, even before we begin to operate. I have also often wondered how the effect is produced on the pulp by the solution; how the solution is taken up, and in what manner the anesthesia is produced. Soreness occasionally supervenes in teeth that have been subjected to pressure anesthesia, after they are filled. Some—and I believe the essayist—advise the use of adrenalin as a medium for dissolving the cocain. I used this agent for some time, but discarded it later on. I first used distilled water, then adrenalin, and then went back to water, as I found I had more teeth with after-soreness when I used the adrenalin than when I used water alone. As to the cause of this after-soreness, I doubt if it has ever been definitely solved. Dr. Ottolengui advanced the idea that it came from secondary hemorrhage. He says that after the pulp is removed a dressing of dry cotton is placed in the canal and allowed to stay for a few days; if when this dressing is removed there is blood on it, a secondary hemorrhage has occurred. It would seem that secondary hemorrhage might reasonably account for this after-soreness.

I have never used the high-pressure syringe for the removal of the pulp. It can be used of course to obtund sensitive dentin, but if one wants to remove the pulp a much easier method is to produce the anesthesia by the rubber pressure method. For obtunding sensitive dentin Dr. J. Edw. Line of Rochester uses a solution of cocain on the bur while excavating the cavity. As he excavates the cavity, he runs the bur very slowly, and the solution is forced into the tubuli of the dentin, producing a very satisfactory degree of anesthesia in advance of the bur. I have successfully tried this method a number of times.

Dr. L. C. JONES, Wolcott. It does my heart good to hear someone say that he has obtained good results with pressure anesthesia. It has been my experience that pressure anesthesia does not always result in the painless removal of pulps. I have tried this method time and again, and have been humiliated many times by the results. I have used enough cocain to produce anesthesia of the whole maxilla, but the pain would persist in the canal when I applied the broach. I am hoping that some day I may have results different from this, but I still have to depend on arsenic. I believe that if the advocate of pressure anesthesia could have it applied to a congested pulp in his own mouth, he would be forever after dumb on the subject.

Dr. ROOD. I would like to ask Dr. Hert how long he waits after making the application of cocain before using the broach.

Dr. HERT. That is a point upon which I intended to speak more fully. As a rule I am able to produce anesthesia readily, and only wait about half a minute. Where pulp-stones are present, or where the pulp is slightly disorganized, it takes much longer for the cocain to be absorbed. The tissues in such conditions do not seem to absorb the solution so readily but in the ordinary cases I think one-half minute is all that is necessary.

Dr. E. R. GRISWOLD, Dansville. Dr. Hert speaks of sensitiveness at the end of the root. I have investigated and inquired into this phenomenon somewhat, and to the best of my knowledge the after-soreness is caused by a blood-clot. The essayist speaks of using adrenalin as a hemostatic. Now, anything he may use will facilitate the formation of a blood-clot. In using a hemostatic you only stop the flow a little sooner, thereby forming a larger clot, and to my mind the better plan is to let the pulp bleed until it stops of its own accord, unless, of course, the hemorrhage be severe.

Dr. Hert speaks of pressure anesthesia having completely superseded the use of arsenic in his office. I believe if that be the case he has reached the millennium with reference to the devitalization of pulps. I do not think that the majority of us use pressure anesthesia in each and every case. There are many cases in which we cannot take the time to do so. Then again, in the case of pulp-stones, the tissue will not absorb the cocain, and I do not believe that we will ever get along without arsenic in our practice. Then again, it is difficult to apply the solution in the upper teeth. I am now using a preparation which came to my attention through a sample sent to my office. It is a preparation containing a percentage of cocain ("neurocaine"). I simply take a piece of the preparation of about the size of an ordinary pinhead and place it on the exposed nerve, and then place a drop of water over the anesthetic, and by means of pressure anesthetize the pulp so that it may be removed painlessly.

Dr. W. W. Smith, Rochester. Within the last four or five days I had occasion to remove the pulps from two central incisors. The teeth were perfectly sound, but on account of an extreme protrusion it seemed that the only way of remedying the evil would be to cut off the crowns and replace them with artificial ones. I used the Myers obtunder to gain access to the pulp. In the first tooth, after gaining access to the pulp, I used pressure anesthesia by the method described by Dr. Hert. There was no hemorrhage, and I removed the pulp and filled the root immediately. In this tooth I rather expected trouble because of the lack of hemorrhage. The next day I followed the same procedure in the other incisor, and to my astonishment there was a profuse hemorrhage, and after controlling it I filled the root. In the last tooth the soreness has continued until the present time, but in the case of the first tooth there has not been any discomfort.

Dr. C. W. LaSalle, Rochester. Some time ago I had an experience somewhat similar to that of Dr. Smith's. The pulps of two canines had to be extirpated for the same reason given by Dr. Smith in the case of the incisors. There was an extreme sensitivity to pain in the dentin, and I first had to obtund this. I introduced cocain and adrenalin and amputated the teeth. When the pulp from the first tooth was extirpated it was absolutely white throughout its entire extent. I immediately filled the root. That tooth became sore within the next forty-eight hours, and remained in that condition for some time. The removal of the pulp of the other canine was followed by a profuse hemorrhage, but the tooth has been quiet ever since. I very seldom fill teeth immediately after using pressure anesthesia. One effect of cocain is that of a hemostatic, and I think that accounts probably for the after-pain in filling roots immediately, because in the area of the apex, the tissues being insensitive to pain, one cannot tell when the apex of that root has been reached.

Dr. W. C. Wilbur, Corning. Dr. Griswold said that the millennium had been reached when we discarded the use of arsenic. I do not think for five years I have had any arsenic in my office, and I never fail to extirpate a pulp painlessly. So far as I am concerned I do not think there is any use for arsenic in the dental office. In Dr. Smith's case, where he mentioned that irritation had supervened in one central incisor and none in the other, I think if we will take into consideration the character of the operation performed it is not at all to be wondered at that there was irritation. It is a wonder that irritation is not always produced in such operations. Under the influence of cocain we carry the nerve-broach up into the pulp and twist it several times, and remove the pulp. There is no pain at the time because the pulp is anesthetized by the cocain, but the violence of twisting and jerking the pulp out causes an irritation at the apex when the pulp is severed, and if the irritation is great enough to produce an inflammation, more or less severe pain is felt when the effect of the cocain passes away.

With regard to forcing septic matter through the ends of roots, we know that in some teeth the apical foramen is very small, and in others it is large enough to run a broach through without any trouble. I think the principal cause of irritation when we use pressure anesthesia is that in using the pressure, the pulp being in a putrescent condition, we force septic matter through the end of the root. I think, however, that it can be avoided. I had trouble in this way at first, but when I rendered the pulp aseptic before I produced the pressure, no soreness followed the extirpation of the pulp. I use equal parts of tricresol and formalin to render the pulp aseptic.

Dr. S. M. Weaver, Cleveland, Ohio. The subject of pressure anesthesia has been one of great interest to me for several years, and especially the subject now under discussion—inflammation after the extirpation of the pulp. I have come to the conclusion, after hearing a great many dentists claim that they extirpate pulps with adrenalin and cocain and fill the root-canals immediately without painful after-effects, that I must be a rather bunglesome operator because I cannot do it. If I use adrenalin and cocain and fill the roots immediately soreness always supervenes, and before adrenalin was put on the market I do not think I ever had any case of post-operative pain. I attribute post-operative pain to the vasoconstrictor action of the adrenalin, which results in the formation of a blood-clot in the apical space. The removal of the clot by nature causes the soreness. I believe the secondary hemorrhage is the cause of the soreness, and consequently we should never fill root-canals until from twenty-four to thirty-six hours after the removal of the pulp. Again, if the pulp is thoroughly anesthetized, the apical region is also anesthetized, and because of the latter condition it is not possible to ascertain whether the instrument has been carried beyond the apex, thus lacerating the periapical tissues. If, however, one waits twenty-four hours or more, the patient will let the operator know if the instrument has been forced through the root and beyond the confines of the root-canal. I think also that there is a liability for filaments to be left in the root when the pulp is profoundly anesthetized, and these are likely to give rise to painful phenomena.

I have had success in the obtunding of the dentin and the removing of the pulp painlessly by the use of the obtunding instruments. If there is an exposure, I first cover it with thin cement carefully; then, by making a small aperture in a convenient place in the tooth and by means of the high-pressure instrument, I force the cocain into the pulp. I then take a No. ½ bur, open through to the pulp-chamber, and apply the cocain directly to the pulp. One must be careful not to open the pulp-cavity too freely at first, for often this results in slight pain. If this occurs, apply the medicament again, and in that way we can extirpate the pulp without the patient suffering any pain at all. If we are going to tell our patients that we remove pulps without pain, I think we should take every precaution to live up to our word.

Dr. G. W. PRINGLE, Niagara Falls. I first want to compliment the essayist on his paper. In regard to after-soreness, Dr. Eschelman of Buffalo suggested something to me about a year ago which has proved very satisfactory in preventing it. It consists, after removing the pulp with pressure anesthesia and waiting for the hemorrhage to subside, in placing in the canal a dressing of cotton saturated with full strength extract of witch hazel, leaving the dressing in the canal, dismissing the patient, and taking it out at the next sitting, at which time the root-canal is filled. Since I have followed this plan I have had very little trouble from after-soreness.

Dr. L. MEISBURGER, Buffalo. I did not intend saying anything on this subject, but after the astonishing remarks of Dr. Wilbur I will say a word or two. I am still in the habit of occasionally employing arsenic. I think there are some cases that come into our hands where it is utterly impossible to thoroughly anesthetize the pulps by the use of pressure anesthesia. I try to use every precaution that is known to us as far as cleanliness is concerned, and I always employ a mild solution of formalin before performing operations; but I have come across cases occasionally where it is impossible not only in a few seconds but in half an hour or more—if we continue the pressure anesthesia intermittently—to anesthetize the pulp to that degree of insensitivity which will enable us to remove it painlessly, and in such cases I do resort to the use of arsenic. What the condition is that brings this about I am not prepared to say, but apparently there is a certain peculiar idiosyncrasy in these people which makes them immune, as it were, to the influence of cocain applied by the pressure-anesthesia method.

Dr. F. W. PROSEUS, Rochester. I think the subject has been well covered except that condition to which Dr. Meisburger referred where it was impossible to obtain satisfaction from the use of pressure anesthesia. You will find such cases sometimes, and however conscientiously you may try to anesthetize these pulps, you will invariably fail. It is my experience that in such cases the trouble is due to a hyper-congested condition of the bloodvessels, with partial strangulation of the pulp. Consequently one is forcing the cocain solution into practically almost a dead mass; it is not taken up by the circulatory vessels of the pulp, and consequently only a partial local anesthesia is obtained. I think that one of the hardest conditions with which we have to deal is where the tooth is aching when the patient comes to the office—for instance, an exposed pulp in a first molar in a child ten years of age. The tooth has been aching for several days, the pulp is fully exposed. I have heard men advocate the treating of these cases by pressure anesthesia, claiming that it could be done without pain. My experience is that it causes additional pain. I have never tried the plan Dr. Weaver suggested of capping the exposed pulp and then injecting cocain through an opening made into the dentin. Possibly that might work successfully, but my method of treating these cases has been a happy one—*i.e.* by using parts of Scheuer's formaldehyd paste and cocain crystals, adding to this an amount of the S. S. White devitalizing paste made of morphin sulfate, arsenic, and creasote, equal to one-half the dose of the formaldehyd paste. Upon mixing enough of these ingredients for one application upon a slab, the mixture will assume a creamy consistence. After sterilizing the cavity, take the mixture on a broach and simply wipe across the pulp, as it remains where placed. Now flow cement over the paste, without causing pressure, by means of a nerve broach. This is done by wiping cement laterally through the interdental space—if the cavity be an approximal one. A tooth may have been aching severely, but I have found very few cases in which this treatment did not stop the aching within a few minutes, and keep the tooth from aching until the next visit, four or five days afterward. In some of these cases I leave the preparation in place for two weeks when I often find the pulp in a devitalized condition. My theory in regard to the action of this paste is that the formaldehyd paste keeps the pulp fully sterilized, and that the cocain from the slight pressure caused by flowing the cement over the pulp is absorbed, thus obtaining the advantage of pressure anesthesia in a gradual way, while the arsenic in the preparation gradually devitalizes the pulp. Whether this theory is true or not I cannot say, but that it does produce very happy results I can say, and it would be of advantage to all to have the preparation in your offices.

Dr. **Wilbur.** I would like to say a few words of explanation. We know that it is very seldom we can fill teeth absolutely without pain. Dr. Weaver says that if we claim to do painless dentistry we should do it without any pain whatever, and yet when he takes that bur and makes a little indentation in the dentin he causes pain when inserting the instrument. I think the average "painless dentistry" is described very well by a definition a patient gave to me the other day—one that was given to him by a dentist in New Haven: "Painless dentistry is where the dentist succeeds in doing an operation without giving so much pain that the patient cannot stand it." We know that there are many teeth that come to us with exposed pulps, where we can by pressure anesthesia anesthetize the pulp and remove it without the patient being conscious of any pain at all; but during the application of the pressure there will be, however, some slight sensation. As soon as a slight sensation appears while forcing the cocain in, stop the procedure. Hold what has been forced for a few seconds, ten to fifteen, and then apply a little more pressure, and usually in from twenty to thirty seconds the pulp is fully anesthetized.

I recently heard a practitioner say that he had spent fifteen to twenty minutes in trying to anesthetize a pulp. I have spent an hour or two in trying to take a pulp out painlessly, but I finally removed it, and did it almost painlessly. When a portion of the pulp is anesthetized, it can be removed with the bur, and a fresh surface is thus secured which will be more readily acted upon by the new application. I have done this for four or five years, and I have never had a case in my office where I could not by being cautious take out the pulp with practically no pain. The pain when any exists in these cases is from the pressure, and with care it is reduced to a minimum. You should take the time required to do the operation, for I believe that an hour spent in this way is well spent, in order to avoid the use of arsenic, which we know is a dangerous agent.

A previous speaker said that there are cases in which we do not have the required time to apply this method. If we have the time to make an application of arsenic to the pulp, we can in the same length of time apply a dressing preparatory for the pressure anesthesia. The amount of time spent in opening the pulp-chamber for the arsenical application could be utilized in preparing a similar opening for a dressing of oil of cassia, which will freshen up the pulp and make it more readily responsive to the effects of the cocain applied at a future sitting.

Dr. L. S. GOBLE, Rochester. I wish to corroborate every word Dr. Wilbur has said with regard to pressure anesthesia. I was very much surprised to find that so many have been unsuccessful with the method. I never fill the roots of a tooth immediately after removing the pulp, and it may be that this accounts for my success, and it also may be that other dentists know of some of my failures of which I am not aware at present. I know of a practitioner who had applied arsenic in a tooth every month for a year and three months, and at the end of that time had not devitalized the pulp. Probably cocain applied to the same tooth would have acted in the same way. I have worked for two hours with pressure anesthesia and made little progress, but if you will make an application of oil of cloves or cassia to the pulp to remove the congested condition of the pulp so that it will take up either arsenic or cocain, the next time the patient comes, as Dr. Wilbur says, it becomes a very simple matter to anesthetize the pulp. You will then find that the tooth on which you might have worked for two hours or a day will respond in two or three minutes to the cocain. You will also find that this same procedure works very satisfactorily prior to the application of arsenic.

Dr. COON. I would like to ask if oil of cassia would not discolor the teeth?

Dr. WILBUR. I do not think it discolors vital teeth.

Dr. COON. It does in my practice.

Dr. GOBLE. Not when used for a period of two or three days only.

Dr. W. A. WHITE, Phelps. This subject has been discussed ever since I have been a member of the dental profession, and we all have different methods and modes of treatment. A number of years ago I read an article by an expert in surgery in Chicago, and he said that he never devitalized the pulps of teeth. When a patient came to his office with an exposed pulp, he simply cut out a V-shaped piece of the pulp, brought the ends together, and capped the pulp. Not everyone is skilful enough to do this, and very few would try it.

We have in the Seventh District Society a practitioner whose excellent advice and admonition we have enjoyed for many years, Dr. Frank French. A number of years ago I had an exposed pulp in my own mouth that had been capped unsuccessfully, and I went to Dr. French to have him devitalize it. He proceeded to make an application, and when I asked him what it was, he said it was none of my business, but if it worked successfully he would tell me. It proved successful and he then told me that he had used commercial arsenic. The only way I can describe it is that he used commercial arsenic, which can be purchased at any drug store, five cents worth of which will last a lifetime. Dr. French simply scraped off a small portion of this, and dipped a piece of cotton in carbolic acid and then in the powder, and placed the dressing in the tooth. It resulted in the pulp being devitalized without the slightest pain. I do not want to detract from the value of various remedies on sale at the dental depots for this purpose, but a trial of Dr. French's method is worth consideration.

Dr. Griswold. Dr. Wilbur says he never uses arsenic. There are times when it is entirely right to use arsenic, and every advocate of pressure anesthesia is compelled to use it at such times. Where we use pressure anesthesia we must extirpate the pulp immediately. Now, some days, we are absent from our offices, or possibly so busy at the chair that we cannot spare the time required for the use of pressure anesthesia for various reasons, and I venture to say that in such cases a majority of the men in this assemblage would use arsenic. I am not a strict advocate of the use of arsenic, as, however, I use pressure anesthesia where possible; but there are cases where we cannot anesthetize the pulp by pressure anesthesia and remove it painlessly.

Dr. J. Q. Byram, Indianapolis, Ind. I am one of those operators who cannot remove all pulps painlessly. I use arsenic, and I believe under certain conditions arsenic is the greatest remedy we possess. In nervous persons with highly sensitive teeth arsenic seems to me to be indicated. I never fill the root-canals immediately after removing the pulp. I believe it is a common experience that if we fill the canals immediately, future complications are likely to arise. I wish to offer a suggestion. I use carbolic acid instead of cocain as an obtunding agent, and in my experience there is less pericemental complication than with cocain. The essayist believes that if we use a great amount of pressure, we are not only forcing the agent through the apical region but through the tubuli as well, and that, in consequence, we will have irritation of the pericemental membrane. I question very much whether these high-pressure syringes are best, if not used with the greatest care. I have experimented with them in extracted teeth, and have found to my surprise that the degree of pressure obtained is sufficient to force the solution through the tubuli, thus making possible the onset of pericemental complications. I believe we can use enough pressure with the unvulcanized rubber to cause some trouble, but we are not as likely to do it with this method as with the high-pressure syringes. I would not have you understand that I am condemning the high-pressure syringes, but I want to emphasize the importance of using them with care. Do not labor under the impression that all the force obtainable with them can be used without fear of complications.

I want to ask Dr. Wilbur a question. He spoke of the use of tricresol and formalin before applying the cocain. Now, we know that this combination is a very dangerous one to vital tissues, as it causes severe pain when it comes into contact with them. I cannot understand how he uses that preparation on an exposed pulp without causing much pain. With reference to oil of cassia, I must say that in my experience it is the most irritating of the essential oils, and I condemn its use as a sedative. I would prefer a solution of chloroform and cocain rather than the oil of cassia.

Dr. R. A. Wilbur, Elmira. I just want to answer that question regarding the use of tricresol. I think my brother uses this combination when the pulp is in a state of partial disorganization. I never heard of his using it on live tissue.

Dr. Hert. I did not claim that the use of arsenic was obsolete. In the opening portion of the paper that statement is made, but in my discussion I stated that I did not think it was obsolete from what I could learn, but that in my own practice its use had been discontinued. The use of oil of cassia has been mentioned. A number of years ago Dr. Peck of Chicago made a number of experiments with the essential oils, and he found that oil of cassia would produce the greatest irritation of any of the essential oils; while oil of cloves would produce the least.

Dr. Cantwell (closing the discussion). I wish to thank the society for the courtesy shown me in the discussion of this subject. With regard to the use of pink rubber—an old dentist once told me always to use pink rubber for this purpose, and I have used it ever since, but I forgot to ask him his reason for using it. I suppose, however, that any rubber that will confine the liquid to the cavity will serve the same purpose. Dr. Hert says that he uses flat-headed instruments for causing the pressure. I prefer the ball-pointed instruments, a difference in the technique we employ in our offices. With regard to the immediate filling of root-canals, I have never attained that proficiency in my practice where I felt safe in filling the canals immediately after removing the pulp. The length of time required to obtain results with pressure anesthesia is in some cases greater than in others, but I have never worked over an hour on a pulp. I usually obtain satisfactory results in half a minute.

The subject was then passed.

(To be continued.)

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, November 1905.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, November 21, 1905, at the Academy of Medicine, No. 17 West Forty-third street, New York city.

The president, Dr. John I. Hart, occupied the chair and called the meeting to order.

The Secretary read the minutes of the last session, which were approved.

Dr. WM. CARR read the report of the committee appointed to take action and draw resolutions on the death of Dr. Chas. E. Francis, as follows:

To the President and Members of the New York Odontological Society:

It is with profound sorrow that we record the death of Dr. CHARLES E. FRANCIS, at his residence in Stamford, Conn., on July 2, 1905, in the seventy-eighth year of his age.

For many years an honored member of our profession, he was one of the founders of this society, one of the charter members of the First District Society, a member and ex-president of the Dental Society of the State of New York, a member and ex-president of the National Dental Association, and an associate member of the Connecticut and the New Jersey State Societies, as well as of many other dental societies throughout the Union. It was largely through his instrumentality that the New York College of Dentistry received its charter. He was born in Hartford, Conn., but for fifty years was actively engaged in the practice of dentistry in this city, enjoying one of the most lucrative practices in the state; retiring in March 1902.

He possessed a commanding presence, having a dignified bearing, which gained him respect in any assemblage; he was modest and unassuming, gaining at once the esteem of those with whom he came in contact. This was particularly true of the young, for whom he always manifested the greatest sympathy, being always ready to give them the benefit of his experience and advice. His ideals were lofty, and his efforts were guided by good judgment. He was a lover of nature, and was never happier than when wandering through the woods near his summer home, in the company of some young friend.

It would be impossible to do full justice to the beauty of his personal character, or to overestimate his successful life-work. We believe that all who had the honor of knowing him will agree with us, that his life should be an example to the younger members of the profession, as well as an incentive to greater effort on the part of the more mature and experienced.

A devoted husband, an indulgent father, his home and social life was a beautiful example of what a Christian's life should be.

RESOLUTIONS.

Whereas, The profession and this society have sustained a great loss in the demise of Dr. Charles E. Francis; therefore be it

RESOLVED, That the foregoing expression of our appreciation be spread at length on the minutes of this society as evidence of our sincere grief, and that the secretary be instructed to forward a copy of it to the family of Dr. Francis, as a token of our heartfelt sympathy.

WM. CARR, *Chairman.*
A. L. NORTHROP
S. G. PERRY,
Committee.

Dr. Walker moved the adoption of the resolutions, and the motion was carried by a rising vote.

Dr. THOMAS P. HINMAN, Atlanta, Ga., then read the paper of the evening, entitled "Gold Inlays for Bridge Anchorages; also Hood Abutments."

[This paper is printed in full at page 721 of the present issue of the COSMOS.]

Discussion.

Dr. OTTOLENGUI. I want to say publicly that I made but one gold inlay before I saw Dr. Hinman's work last May, and I removed that one recently, putting a new one in its stead. For us old fellows, the gold inlay has just about arrived in time. I will give you a case from practice. I had a patient come in with a distal approximal cavity in a canine, without any natural separation, and she objected to having one made. She would not wear a wedge, nor would she consent to the use of separators. The cavity was practically a palatal cavity, that is, one in which any filling material inserted would not show from the front. I took out a gutta-percha filling that I had put in to tide the tooth over; but, gentlemen, when you tide anything over, the day at last arrives when you must do the work right, and probably with more trouble than you would have had in the first place. To put a gold filling in that tooth without any separation would have been a difficult problem. I put in a gold inlay according to Dr. Hinman's teaching in forty-five minutes, and dismissed the patient. The bulk of the work was done in the laboratory and not on the patient, and I can truthfully say that it is difficult to detect that it is an inlay. It looks exactly like a gold filling.

I must admit I have been skeptical about this hood attachment. I have been very skeptical about the Carmichael work and also Dr. Alexander's, but Dr. Hinman's work seems to me to be better. His hood over the bicuspid appeals to me very strongly; so much so that I arranged with a patient this afternoon to do one next week.

The point of importance is this: there is a revolution in dentistry at hand. We who have been making gold fillings for so many years have looked askance at all sorts of inlays on account of the cement, and it has been said a hundred times at dental meetings that if we could only obtain a perfect cement, we would have a grand way of filling teeth. We seem to have a perfect cement, because curiously enough, however they may look to the eye, that joint is closer which is made with cement than any other that is made—yea, by the best of our practitioners—with gold foil. I have not only seen the models passed around, but other cases, for Dr. Hinman makes it a rule that all his patients who go to New York shall call to see me, and I can say all the cases are beautiful.

When we insert a gold filling, which of us is absolutely certain of contact at every possible portion of a cavity wall? By using a plastic and forcing a properly made and well-fitting inlay into it we have as near contact throughout that cavity as a human being can obtain, and I believe it is that absolute cohesive contact that makes the inlay superior to an ordinary filling.

It is my experience that with practice inlay work may be easily acquired. As I said before, Dr. Hinman showed me this work in May, and I exhibited tonight a couple of rather difficult inlays I have made, not as an evidence of how skilful I am, but as an evidence of the fact that anybody can learn how to do this work.

The PRESIDENT. All of us who saw the work of Dr. Ottolengui this evening must admit that he secured ideal margins. I had no idea that under such difficult conditions it would be possible to make joints with gold inlay work as perfect as he did; and that is why I called on him to open this discussion.

Dr. Shields has kindly consented to take part in this discussion, and we would be pleased to hear from him now.

Dr. SHIELDS. I have had some experience with these inlays, and thus I was able to follow the paper readily. The idea of mutilating a molar in making these separate steps is to my mind absolutely out of order. The age of the patient is not given. If you follow this procedure in young patients, injury to the pulp would result. If the patient is sufficiently old and there is much recession, you could do it more freely. The principle of a gold inlay is absolutely right if constructed on accurate lines. This mechanism, involving such extensive cutting, I have never employed in constructing a posterior abutment for a bridge, because in my hands it has not been necessary. You can take the very case Dr. Hinman so beautifully described. It has a compound cavity on the occlusal and antero-approximal surfaces. You can utilize such cavities in the construction of a gold inlay in a beautiful way. If the patient is young, it is improbable that the teeth will be loose. If the teeth are loose, the treatment is different from what it should be when they are tight. Where the teeth are loose you must first make them absolutely rigid, in which case the pulps should be removed and anchorage secured in the pulp-chambers or in the root-canals.

This paper deals with tight teeth, and in such cases I would simply take advantage of the cavities on the grinding surface and on the anterior approximal surface and make a gold inlay, using a piece of iridio-platinum pin metal for the interior portions. The post extending into the occlusal cavity is bent at right angles with the horizontal portion, which should be allowed to extend through the approximal cavity into the dummy. If there be no approximal cavity, make one just a little larger than the pin metal used, and when soldered to the pure gold—that fits the cavity perfectly—you have the strongest possible abutment, and an inlay without any mutilation excepting on the occluso-approximal angle, with simply the appearance of a gold filling.

I do not think this idea has ever been presented to the public, although it has been my pleasure to explain it often to individual dentists. When you set a bridge in that way, there is no danger of it ever breaking at the point of junction of the inlay and dummy, and also avoids excessive mutilation to gain strength and a broad surface of gold to solder the dummy. The avoidance of cutting is always a serious consideration, because the patient is spared much unnecessary pain and subsequent inflammation of the pulp.

Take for instance the attachment to this central shown here tonight, which is beautifully made. Is that a fair example of conservative dentistry?

Dr. HINMAN. That specimen was not presented at all. It was not even described in the paper. It was done by my assistant and thrown out. (It consisted of a pure gold foundation made to fit the palatal surface, with pins set through and soldered—to fit two small holes drilled into that portion of the tooth.)

Dr. SHIELDS. That is the disadvantage of not having previously read the paper. I got more from the model than from the paper.

In regard to the attachment of anterior teeth, if the tooth for the anterior abutment be loose, have no hesitation in removing the pulp and anchoring the pivot into the root-canal. Bend the pivot at the palatal surface, allow it to project, and solder it to the dummy next to it, but do not mutilate this tooth in forming the step as described by Dr. Hinman.

In the construction of this hood for a bicuspid, where there is an anterior approximal, a posterior approximal, and an occlusal cavity, take the iridio-platinum pin, extend it across the grinding surface, and bend it at right angles to the cervical portion of the posterior approximal cavity, allowing the horizontal portion to extend, for the purpose of soldering to the dummy, and also to avoid cutting. I can say that I believe it to be the strongest and most artistic inlay and abutment that can be made.

Dr. J. BOND LITTIG. I only want to make a few remarks in regard to the small pinholes spoken of in the paper as forming the basis of the hood, or the attachment to the hood. It is generally considered that they will not hold. I can verify the fact that they will, because probably most of you remember how many of those tips of porcelain and of gold I have put on teeth, held solely by the wires inserted in those little holes. They are there today. I put on three or four for a patient who lost most of the back teeth, and had to chew on the front teeth. That was ten to fifteen years ago. That person was in today, and they were intact. The attachment is perfect, and the hood attached with those pins will stay without any trouble.

The attachment of the wire Dr. Shields speaks of in forming the bridge is certainly an improvement over the simple soldering of a base from approximal surface to approximal surface; but when the inlay has been filled up to the extent shown a strong base will be secured, and I think there will be little danger of its moving.

Dr. OTTOLENGUI. It just occurs to me that it is some eighteen years ago that I took a patient of mine to Dr. Littig to have one of those tips put on that he describes, and it is there yet.

Dr. SANGER, Orange, N. J. I would like to have Dr. Hinman give us his method of making the inlay.

Dr. S. G. PERRY. In regard to gold inlays, it might have been fair to assume that when the porcelain inlay came, it would be used for more than its legitimate purpose; that is, for the restoration of portions of teeth that were exposed to view, and that naturally—through the enthusiasm of some dentists—it would be finally used quite indiscriminately on the surfaces of the posterior teeth. I have used the porcelain inlay somewhat on approximal surfaces of bicuspids and molars, and very often on buccal surfaces, but very few times on occlusal surfaces; never with great satisfaction except on buccal surfaces, but always with a feeling of uncertainty, owing to the brittleness of the material itself. I have felt that the profession might go too far in making restorations with porcelain in the posterior teeth. You may remember that I have been a crank for many years on the prosthetic side of the question, and the great desirability of restoring everything in the front of the mouth with porcelain, so that it would not show; but in hidden places we need not, since the advent of the gold inlay, consider the porcelain inlay at all. I see that my prediction is being realized, as some of our men are inclined to recede from the free use of porcelain in teeth not exposed to view.

I have been ready to be sympathetic toward the use of the gold inlay, and while I have not attempted many I have been ready to approve it, and to welcome it in the restoration of all unexposed portions of the teeth. I think the gold inlay can be made almost as easily, perhaps, as can the porcelain inlay. It has one great advantage and must always have it over the porcelain inlay. That is, that a very close joint can be made in the beginning if the work is properly done. After it is set, one can still improve it by the burnishing of the edges of the gold and the adjustment to the cavity margins, which cannot possibly be done with porcelain. One can go so far as to tease out the little line of cement, and the gold is so soft that it can be burnished down to take the place of the slight deficiency of cement that has been taken away; or one can even crush out the cement. It is possible to secure as perfect margins as with gold fillings. Some difficulty may be experienced along the cervical borders, but with properly shaped burnishers it is still possible to make the margins secure.

Dr. Ottolengui mentioned a point in reference to setting inlays. I think I brought out the same point in a paper I read at Albany; namely, that in the setting of an inlay of any kind by means of cement the personal equation is eliminated. With the utmost carelessness and with inexperienced hands, any inlay can be placed in a cavity and a perfect joint secured. The most finished operators with gold cannot always make a perfect edge. Whether it be a porcelain or a gold inlay, a better fit and a better condition around the body of the inlay than could be secured by the use of any kind of filling material. So the point is, What will your margin be? What sort of fit can you make there? If you will set your gold inlay you will be perfectly sure to make a perfect fit except at the margin, and if you can make that perfect you will have something very satisfactory.

To come to the paper, I must entirely

agree with Dr. Littig, and it is to him we must give the credit of first placing porcelain tips by the use of the little pins in the ends of the teeth. Metallic caps or plates set with pins can be placed in the substance of the teeth on their ends, or on the surfaces of the posterior teeth, or on the sides of the teeth. Dr. Littig only speaks the truth when he says that they stay there surprisingly well. Dr. Tracy has seen cases where I opened the bite by inserting plates of platinum or gold that were held by pins set in the grinding surfaces of the teeth. One of my patients wore plates of this kind for many years; in fact, wore them to his grave. He was a strong, muscular man, and chewed hard on them, but they never gave way. I do not know how many times I opened the bite in that way.

Dr. Prentiss, I think, has also recently seen where I have set caps on the ends of the teeth for opening the bite. They cannot give way. I have also made them in the way Dr. Hinman mentioned tonight, except that I did not make the steps.

I have used the hoods also, not quite so distinctly and so freely as he has done, but with very satisfactory results. I think I showed to Dr. Prentiss several years ago one set for a western lady, where a little dummy was attached to the band, which was put freely around and over the teeth. A more perfect attachment could not be made.

Dr. Hinman's paper will be of great benefit because it will set us thinking; much will be done in that direction to the good of the patient and the profession. This system appeals to me because it does not imply disturbances of the gum, and if there is anything I despise, it is putting any kind of a band or attachment around a tooth which will in time destroy the natural attachment of the gum.

I only intended to say just a word, and that was on the advantage of burnishing the edge of the gold inlay, which cannot be done with the porcelain one.

Let us use the porcelain, and let us be happy that we have it where we want to beautify the mouth; but I beg of you, particularly the younger men, do not spend too much time in putting porcelain in the posterior teeth, because it is brittle and will crumble, and will be a delusion and a snare. Do not promise your patients that you have done something permanent. Look at your gold fillings thirty-five and forty years old, doing splendid service today. Do any of you think your porcelain inlays in the posterior teeth will last that long? You know perfectly well, in your secret hearts, that they will not.

If the porcelain edges do not crumble in time, the cement will disintegrate, and decay will follow. We must look very far into the future for the real test of our work.

Dr. Reitz. I have had no experience in making gold inlays at all. My knowledge of them is confined almost entirely to what Dr. Rhein has told me about the large gold fillings that he put in, which having fallen out, were reinserted and held in the cavities with cement.

If gold fillings that will do good service can be inserted in that way, I do not see why gold inlays could not be used in the same manner. I hope to know a little more about this subject later. I might add that what I have said about Dr. Rhein's experience applies to a single instance.

Dr. Van Woert. I want to express my appreciation of the very lucid manner in which Dr. Hinman has expressed himself in regard to gold inlays. It takes me back quite a number of years, and I think Dr. Ottolengui will bear me out in what I am going to say, and if Dr. Geran were here he would testify to it as well. You all remember Dr. Straw of Newburgh. About fifteen or eighteen years ago we had a clinic and demonstration at my office in Greenpoint, as it was called then—now the Seventeenth Ward of Brooklyn. The question arose as to the stability of malleted gold on the ends of teeth, and of gold tips or fastenings such as described by the essayist this evening. My portion of the work consisted in restoring the tips of three or four teeth in Dr. Straw's mouth. Dr. Geran and Dr. Ottolengui did some of the work, and there were others who also operated on him that day. I know for a fact that within six months of his death the made or manufactured tips that were put on were intact. Those that were put on with a mallet had disappeared, and had been renewed. It brings us to one point that is the all-important one; namely, that the mainstay of any filling is the cement. If you can protect the cement from the fluids of the mouth, you have something that will support a filling. I think the cement method of attachment is far preferable to anything we know of.

The porcelain inlay is by far preferable, as Dr. Perry has said, from an esthetic standpoint; but that gold can be manipulated into the molars and bicuspids so as to be perfectly adapted to the margins is beyond doubt. If a line or a sufficient amount of cement intervenes between the floor of the cavity and the inlay, and the anchorages are secure, I believe it will stand longer than any malleted gold filling ever put in, notwithstanding the fact that I have seen recently fillings in good condition that were put in years ago by men like Dr. Perry, Dr. Dwinelle, and Dr. Atkinson.

There is one great drawback in connection with gold operations: the continual change of gold under the force of mastication when there is no support other than tooth-substance. Gold has no adhesive quality to anything, while cement will adhere to the walls of a cavity if it is properly prepared and dried out. If suitable anchorages are made into the inlay there is no question but what they can be made as stable as any gold filling, and the fact that it does eliminate the contact of gold at the cervix or the gum margin is one of the strongest points in its favor.

I personally am much gratified, and feel that it opens up possibilities which otherwise we would perhaps not have recognized for several years to come.

Dr. A. L. SWIFT. I have had very little experience, but that which I have had has been very successful. There was one point I would like to refer to. We hear very little said by the men who are advocating inlays, of both porcelain and gold, of the danger from cement to the pulps. We used to hear much comment on that point, and the state society sent out a circular to obtain the individual opinions of the members. Many men felt that it would cause the death of the pulp in deep-seated cavities. I have always contended that it is not a dangerous procedure.

Dr. OTTOLENGUI. That question has been all threshed out, and that is why it is not referred to. When a pulp dies under a cement filling, it would have died under any filling. There is said to be arsenic in it. The amount of arsenic in cement is not only merely a trace, but it is so minute that even the word trace hardly describes it, and it is in such chemical composition that it is inert. There is nothing in the action of cement detrimental to the pulp, provided the cavity be so prepared as to warrant the insertion of a filling on a living pulp. Unfortunately, pulps die under gold fillings too, but that should not prevent one from inserting a gold filling, provided the pulp be protected by a proper thickness of dentin. It is not the cement that kills the pulp.

Dr. SWIFT. I am glad Dr. Ottolengui says that the question has been threshed out, but I would ask him to refer to the correspondence of that time, and he will find that many prominent practitioners did not agree with him or myself on the subject.

Dr. SHIELDS. In my discussion I confined myself chiefly to the construction of inlays for bridges. In the matter of gold inlays: When the cavity is properly prepared an impression can easily be obtained with "Premium" gutta-percha. Pour a plaster cast, make an impression in Melotte's moldine, and pour the die. The gold can then be swaged into the cavity in the Melotte's metal die; then it is burnished in the cavity, and after filling it slightly with solder, burnish it again to the cavity; and repeat this adding solder and burnishing two or three times to make the inlay fit perfectly. In my hands they answer the purpose beautifully in cases fitted for resort to them. In the matter of small pins for the retention of tips, of course they will hold. In my discussion I said that no reference had been made as to whether the teeth were tight or loose teeth; but whether they be tight or loose, or in the mouths of young or elderly people, I consider it absolutely unnecessary and harmful to the pulp to cut a tooth for the purpose of forming the two steps described by the essayist.

Dr. GOLDSMITH. What I rise for is to say that I am one of those who have been afraid to insert large oxyphosphate fillings in contact with the dentin of deep-seated cavities without first lining them with some kind of varnish, for fear of any possible irritation of the pulp through the phosphoric acid. I think the fact that so little cement is used in setting inlays eliminates this source of danger to the pulp.

Dr. RHEIN. I was amused at Dr. Perry's remarks, realizing that he was on both sides of the question at the same time. He first spoke of the longevity of the filling and afterward expressed himself as being skeptical on that same point of the inlay question, although he still remains a strong inlay advocate. There is no question in our minds that inlays have come to stay. The abuse of the porcelain inlay has brought about to a certain extent the introduction of the gold inlay. The latter is better known in the West than it is in the East. In defense of Dr. Ottolengui, I must say that they have four or five methods of making gold inlays in Chicago, and also out at the Pacific Coast. It is not a procedure confined to the South—without detracting in any way from the value of the method presented by our guest of this evening.

I think the main point of advantage accruing from the gold inlay is in the cessation of the abuse of what is known as the gold-shell crown. If it should do away with one-tenth of the frightful malpractice that that shell crown has brought about, it will be a great blessing in dental work.

In my own mind that is where the greatest advantage will come. In my travels in the western section of the country I saw evidence of the gold inlay following in the same path as the shell crown; that is, being used in a class of cavities requiring different treatment.

In listening to the observations of Dr. Perry, I noticed that he emphasized distinctly that while the gold inlay is of the utmost advantage in selected cases, in proper cases, it is for the operator to judge of the suitability of those cases. He stated most definitely and most pertinently that no inlay that we have seen up to the present time can ever compare in permanence to a properly inserted gold filling. That does not imply that inlays have not their sphere of application. I agree thoroughly with Dr. Perry, and always have, that where a filling will be exposed to view it is far preferable to insert a porcelain inlay and take chances of having to renew it, than to disfigure the mouth of the patient; but where we have the opportunity, and where our patient requests an ideal replacement of carious tissue, there is no operation in places not exposed to view that can be depended upon as the gold filling properly inserted. I take the strongest issue on what was said to the contrary by Dr. Ottolengui this evening. I claim that there is not a point of advantage that the inlay when complete has over the gold filling that is properly inserted. We do not always insert it properly, as Dr. Reitz says. I showed him a case in my office of a very large gold contour where there was a lack of retention. It came out, and it became a gold inlay.

There is no reason why we should not all take advantage of the lesson that the inlay teaches. In my own practice this has not been a new lesson. I know Dr. Reitz follows practically the same method of procedure. The inner walls of the cavity are lined with cement before the gold is introduced, and we therefore have, when our filling is finished, not only a solid mass of gold with all the advantages that the gold inlay derives from a cement lining, but we have back of that an advantage that the inlay has not and never will have until that ideal cement is introduced for which we have been yearning for so many years. We have an absolute hermetical sealing of the enamel margins at every point, provided the cavity has been properly prepared and the filling properly inserted.

I have seen enough of inlays during the past fifteen years to differ more and more every day from the strong feeling of the permanence of such an operation. That a large number last for years there is no gainsaying; but a proportion of them give out. As a gentleman said to me recently at a dental meeting, the weakest point of every restoration of tooth-substance is as good as its strongest; in other words, the strongest point is no better than its weakest point, and I have seen the cement line give out.

I had two new patients come into my office today asking me to reinsert inlays that had just dropped out. I have ceased to ask patients who their dentists are, so I have no idea nor care who they may be. It may not have been their fault. We all of us have seen imperfect fillings in the mouth last for years without fresh caries setting up. We know that to be a fact. Why do inlays last as they do? Because our patients at certain periods in their lives have what Dr. Johnson in his last book on operative dentistry has portrayed as the "period of immunity to dental caries." During that period a bread pill, if it would stay in the cavity, would answer the same purpose as any filling we could put in, so far as the spread of the caries is concerned. It is immaterial what form of filling be used, or how poorly it is inserted; caries will not progress during that period. Methods and practices are condemned and praised because this point is not properly understood. Inlay work should be judged when placed in the mouth of patients who are not in this state of immunity.

My clinical observation, I say with regret, causes me every day to place less dependence upon inlays than I have in the past. With this feeling, I still believe it is our duty to use porcelain inlays in the front of the mouth, and to replace them, rather than to put the mouth in the barbaric condition of which American dentistry has been so guilty in the past.

There is one other little point I want to touch on, and I believe Dr. Hinman was somewhat desirous that I should discuss it if possible from an antagonistic standpoint, so that he could have the opportunity of controverting what I may have to say. The method of utilizing the inlay for bridge work that was presented tonight does not appeal to me from a practical standpoint. I agree almost entirely with what Dr. Shields said on the subject, but I go considerably farther than that. In the majority of cases where this work is used for bridge work we have to begin with a diseased condition of the pulp. Everything that he has shown us this operation will do will tend to a further irritation of that organ, tending to produce what I have seen so often —the death of the pulp under work of this kind, and consequent abscesses at varied periods.

In other words, I am very firmly convinced that when we consider the age at which bridge work of this kind is undertaken—and I am supposing that under natural circumstances it is past the maturity of life that this work has to be introduced—it is better to remove such pulps at the outset. I can see at the present time very little excuse for a permanent or fixed piece of bridge work. The advantages of a removable piece of work are too patent for me to discuss. We are all acquainted with them. In the majority of these cases that have been shown by the essayist a removable piece of work would appeal to me as one that would not only be more permanent in its nature, but one that would certainly be more cleanly, more easily removed if circumstances demand it, and one that would preclude the possibility of abscesses caused by disorganized pulps.

Dr. Perry. I am complimented by being accused of being on both sides of the question. I take it that anyone who wants to be fair-minded must necessarily be on both sides of any question. My contention for the gold filling as against the inlay was mainly on the ground that the gold filling is based on long experience, and the gold inlay is perhaps as yet in the experimental stage. The gold filling has one advantage over the gold inlay. For the gold inlay the tooth must be opened so as to obtain direct access; for the gold filling it must not be so opened.

I have been inclined to be sympathetic toward this question, because I have so very many times replaced with cement amalgam fillings that have tumbled out, and have repeatedly reinserted gold fillings which I had put in myself, and which had tumbled out through lack of depth of the groove, or for one reason or another, and had come out in a body—particularly in the older days when I used more cohesive gold. A large number of them have lasted for years, doing remarkably well.

I do not know whether we are in contact with the spirits of the other world; sometimes I feel we are. If the spirit of Dr. Atkinson is with us tonight I imagine he is shuddering somewhat at Dr. Rhein's mention of the ruthless destruction of the pulps of teeth; and yet, Mr. President, in spite of Dr. Atkinson and his revered memory (because most of us have a reverence for his enthusiasm, if not always for his judgment and methods), it is a question whether Dr. Rhein is not right; and from the study of bacteriology and the danger of germs of one kind or another, it is an open question in my mind whether it is not better to be bolder than we older men have been about removing pulps and seeing that work is done thoroughly at the ends of the roots, so that infection cannot occur. Perhaps Dr. Rhein is nearer right than some of us would credit him with being—particularly in this matter of the teeth that are loosening; in such cases he and many others have advocated the destruction of the pulps for the purpose of making the teeth more secure. Most of the older men come to that idea very reluctantly, and I am somewhat in doubt still; but I have seen cases where, as the result of the removal of the pulps, the teeth had become tighter. It may be wise, after all, in some of those large cavities where there is danger of the pulp dying under any filling material, to devitalize the pulp in order to obtain a better seat for any filling that may be selected. Both gold and porcelain inlays become serious obstructions in cases where the pulps die and the teeth have to be opened. We need to be careful here.

Dr. OTTOLENGUI. Dr. Rhein spoke of Dr. Perry as a straddler, and then he did such a nice straddle himself that one would think he lives on a saddle horse. He told us practically that no inlay could accomplish what could be done with a gold filling; and then he corroborated Dr. Reitz's remarks that one of his own fillings came out, and he put it back with cement. Was not that an admission that it was better put in with cement than put in as a filling? It seems to me to betoken a confidence in cement that he does not lead us to think he feels.

He says he first lines a cavity with cement, and then completes it with the gold filling. On previous occasions he has explained to us that he used a very small piece of cement, just enough to hold the first piece of gold. If he does that, he does not get a cement lining. But suppose he does smear the entire cavity with cement, then line it with gold, and let it set before he goes on?

I have made this point as one I discovered only since making gold inlays—that is, the fact that the inlay is practically indestructible under a mallet, and enables you with mallet force to insert it with less cement between it and the walls than can possibly be obtained by any filling method. I take it that the less cement lining there is, the better. I want to make another point of difference between the gold and the porcelain inlay. In the porcelain inlay the matrix is stripped off, and consequently there is just that much discrepancy in the fit and that much space for the cement, this being likewise the reason why the inlay is not set with a minimum of cement. In the gold inlay the matrix is utilized. This is a point of difference in addition to the one brought out by Dr. Perry, that with careful burnishing an absolute joint will be made between cavity walls and inlay.

I showed some of this work tonight, and if there were time I could show a very good inlay put in my own mouth by Dr. Goslee of Chicago, two or three months ago. It is the gold restoration of a large bicuspid, and the time consumed by the operation from the time he started to the time I left the chair was forty-five minutes.

Dr. RHEIN. What I wish particularly to emphasize is the danger of running too far with the gold inlay, as we have with the porcelain one. I expect to use the gold inlay very extensively. It was a treat to me to witness the clinics in Portland of Dr. Nyman and Dr. Thompson of Chicago in the making and inserting of gold inlays. I never have seen anything more beautiful, and I expect Dr. Nyman will give a clinical exposition of his gold inlays here this season, when you will all have the opportunity of seeing his method of inserting them. I do not wish to detract from the usefulness of the inlay, and I merely said what I did in regard to Dr. Perry's remarks because I agree with him. There *are* two sides to the question, and it is the individual dentist who has to decide what is best for the given case. It is the old question of the man behind the hoe. I feel like saying to the young men, Do not run off too fast with this gold-inlay practice any more than with the porcelain inlay, where you have a simple ordinary gold contour to build. Where you know you can make a permanent operation with no question of cement margins washing out when the period of immunity to caries ceases to exist—bless your lucky star that you inserted a gold filling.

Dr. OTTOLENGUI. If Dr. Rhein had disagreed with me, I would not have answered, but I want to make the same kind of confession Dr. Reitz made. He says that one of his fillings came out and he cemented it in, and then he admitted that it had not been properly inserted. One of my fillings came out, and just about that time I had published a letter from a practitioner in England, stating that he had had two or three fillings come out, that he had cemented them in, and that they stayed in the cavities even better than before. With that in view, and finding there was no fracture of the walls and that everything was all right, I cemented mine in. I claim it was not possible to anchor a filling in that tooth in the way gold fillings are anchored in, but it was possible to anchor it in with cement, as is proved. That was a long incisor with a living pulp and a cavity embracing practically one-third of the tooth—a long thin fragile tooth. The gold filling that was in stayed two or three years, and then it came out. It has stayed in five years since it was cemented. I have not the slightest idea of giving up gold fillings. I expect to use nine gold fillings to one gold inlay, just as I have done with porcelain; but the place for the inlay is the place where one cannot put in a good gold filling, and where instead of that you do makeshift work with amalgam or gold-shell crowns.

Dr. HINMAN. I do not want you to think that I have gone rampant on the subject of gold inlays and hoods, and that I put them on anywhere, whether it be an incisor, or a third molar, or the back of the head. The idea seems to be prevalent that I was trying to make a universal application of it. We had an old governor in Georgia during the war. Somebody asked him what made a man. He said, "Judgment." It is judgment you must have. The gold inlay is not universal in its application, but it does good service in some cases.

Dr. Shields spoke about cutting steps in the molar, and mutilating the molar. I do not mutilate it any more than you do when you put in an amalgam or gold filling, if you prepare the cavity properly. If the tooth has a cavity in the mesial surface or the crown, I would utilize it, of course.

I did not take up the question of tight or loose teeth, because I had reference to tight teeth only. The idea of using the wire has possibly an advantage, in the manner Dr. Shields spoke of. I have not tried it, but like everything else I hear of that I think is good, I will try it. Wherever there is a good broad surface for anchorage, I have never had one of the hood and inlay anchor bridges break off. If it broke, someone else got hold of it. You know those things happen sometimes. There is absolutely nothing against the pins Dr. Shields spoke of, and if you think it adds to the strength of the device, why, use them.

I want to put in a disclaimer right here. I have heard several say this was Hinman's method. I do not claim anything like that. The making of the inlay Dr. Ottolengui says is my method, but it is not. It is a combination of methods I have had from several men, and I am going to describe how to make it. There are in the procedure some points that I have obtained from one man, some from another, and some I do not know where from.

I do not want Dr. Perry to think I am one of those fellows who display the fact that they fill teeth, and have people ask, "What doctor did all that work for you?"—putting a great big gold filling in the front of the mouth to advertise my work. I have used porcelain. I believe I was the first man to import the Jenkins porcelain in the South. I did that in 1898, and I have been using porcelain for filling purposes ever since, where I thought it an advantage; but I found it to have its weak as well as its strong points. I want to set myself right with Dr. Perry. I did not discuss the question of making the gold inlay. I was trying to introduce this hood, which I want you to understand, and which I believe is a good thing, and something strong. Dr. Shields brought out the preparation of that incisor with a staple and a pin (referring to model not intended for illustrative purposes but put in by mistake). In printing offices you have what is called a printer's devil, and sometimes I think in dental offices we have assistants who could be called by that name. Any person in the world would know if you cut a tooth in that way you would kill the pulp; but you can use the double-step three-pin on the central and not destroy the pulp.

There are certain cases in which this inlay and hood can be used successfully, and I present it with the idea that while there is some good in it, it is not, however, universal in its application.

Dr. Rhein tells us to do away with the gold crown. That is exactly what induced me to take up this work, because if there is anything I despise it is a gold crown, and I have yet to see a gold band fitted around the root by any operator in the world where there was not some inflammation around the margin, and in many cases a deposit. I do not use them—except, of course, in cases that cannot be treated otherwise.

The case Dr. Ottolengui showed tonight was one where the tooth had been cut down and a gold crown inserted, for reasons which it is best not to enumerate. Dr. Ottolengui took the crown off, examined it, and finding that the tooth had not been badly mutilated, made a gold inlay, and placed the tooth in occlusion.

These models were passed around without an explanation of what they were intended for. The case where the bicuspid is replaced is for a special case, and is cited in the paper. In reading the paper, I laid stress on that.

The making of the large gold inlay in front to support the lateral incisor was a special case. I would not begin to think of putting a large inlay in the anterior surface of an incisor. I have as much respect for a patient as I have for myself. I do not want to display a lot of gold.

We will get an abuse of the gold inlay because some men will try to put it everywhere. Dr. Rhein says that there is no advantage in the gold inlay. His viewpoint and mine are different. It is a time-saver, and one meaning less strain on the operator and the patient. You cannot always obtain the consent of patients to submit to the long and tedious operation of filling with gold, especially where it requires the restoration of a large portion of the occlusal surface. You can restore it with an inlay, thus saving much strain on the patient. Of course, the question of permanence we can only judge of in from ten to twelve years. Many of them have been in as long as that. Dr. Rhein does not avail himself of the cement lining—except in the one filling that came out and was reset.

Dr. RHEIN. Dr. Ottolengui was mistaken there. In the average case I do, except at the margin.

Dr. HINMAN. In the case you showed

me you did not. In the occlusal surface of children's teeth, where there is much decay, we usually fill with cement. I find the gold inlay wonderful in the sense that it obviates the necessity of filling certain teeth temporarily. I fill the incisors in young people with porcelain. I do not fill with cement any more. I can do it with just as little pain. It stands in Georgia; I do not know whether it would stand here. The climate is different.

Dr. Rhein has a way of condemning things, but in this case, as he has not tried this anchorage, he is not a fit judge. As for removable bridge work, I have seen just as bad failures in the hands of good operators with removable bridge work as with fixed. It is not so much a question of technique as a question of principle. The principle of a saddle bridge is different from that of a fixed bridge. You can talk and preach about your fixed saddles, but as the Texan does when he has not a good saddle for his horse, you will take them off after a while, and be glad they are off.

Now about the gold "dutchman" or wedge. That is a matter of technique. The gold dutchman is put there with the idea of preventing the solder from pulling the inlay out of the investment slightly, and drawing it out of line. It is made of 22-k. 28-gage plate, filed thin, adjusted accurately and with care, because it can be pushed in too tight; then the 18-k. gold, in an infinitesimal amount, is dropped in, and no shrinkage will result.

Now with regard to the question of making the gold inlay. There are as many methods of making it as there are of going to Atlanta. The way I take is the direct one. The impression method has been touched on tonight, but in a very roundabout way. There is an easier way by the impression method. After the cavity is prepared take an impression in fine modeling composition. Have the cavity wet, and the modeling compound dry-heated; take the impression, chill it thoroughly, remove it from the cavity, and fill the impression with amalgam—preferably copper amalgam. Take the matrix metal and burnish it to position on the amalgam model. You all know that I use this little mallet. It is like a man's Bible ought to be—always with him. Use a little pledget of wet cotton to mallet on, and you will not tear the matrix. When you burnish it down the matrix is practically made. Some trust that matrix and finish up their inlays. I do not do that. The matrix is then thickened, returned to the cavity, and re-burnished. I have already described the making of the inlay out of the mouth. I make a matrix of a piece of pure gold 3/1000 inch in thickness, which is passed between the teeth and forced to place tightly with a pledget of wet cotton, being careful that it reaches over the cervical border. With the thumb press it down over the morsal surface. Let me deviate just a moment: The gold inlay must be anchored in such a manner that it will not be displaced by the force of mastication even before it is cemented in the cavity.

Carry the gold over on the coronal surface with the thumb. Mallet the wet cotton right down between the teeth in order to force the matrix over; then put another piece of wet cotton in the occlusal surface, mallet it down, remove the matrix, and trim it approximately. Anneal it and return it to the cavity, finishing the work with flat and round burnishers. If there are any tears in the matrix except on the margins, mend those tears with pellets of gold. Press them right down over the hole, and they will remain where placed. Thicken the matrix with 22-k. solder, but do not let the solder run over the margins if it can be avoided; then return it to the mouth and re-burnish it after the matrix has been thickened. Remember that point. Have the matrix dry, and take some modeling compound dry-heated, roll it up into a cone, and force it up with the thumb. Have the patient close the teeth to occlusion, and press the compound well to the buccal sides of the teeth with the fingers, the patient pressing the tongue on the lingual surface. Chill and remove the compound, when the matrix will come out with the impression; then you simply make a small articulator of plaster, running the side that contains the gold with sump. I am speaking of cases requiring considerable restoration, as for example occlusal cavities in molars.

Build up all the lost parts of the tooth with hard wax. On the occlusal surface annealed pure gold 1/1000 inch in thickness instead of 3/1000 is burnished. Bring the little articulator together and mash the gold into the wax, trimming the gold on the approximal surface exactly at the point where the knuckle is wanted. Do not let it lap; bring it just to the point you want it. I employ in connection with the building-up of inlays a little contrivance which I have used in the past in the construction of Richmond crowns, which I suppose has also been used by other practitioners. I make what I may term a vent. After investing I fill the inlays from either the distal or mesial side, at the point where the piece of gold 1/1000 inch thick laps over the wax on to the tooth-model. I raise it a little, and put in a little roll of wax. I then cut the tooth from the model and invest it with the little roll of wax downward. Invest it with the distal surface down, wash out the wax, and a little cup easy to fill will result. The hole will be all the way through, and you have your vent.

Dr. LITTIG. Do you cover the occlusion with anything?

Dr. HINMAN. Yes. I cover everything except the wax on the mesial side. Underneath, this little bit of wax is sticking down, and when it is washed out there is a hole produced extending throughout the investment, which acts as a vent and prevents bubbles in the solder.

Dr. RHEIN. Why don't you make the vent on the inside—the side corresponding to the floor of the cavity?

Dr. HINMAN. Because it would require cutting a hole through the matrix—and that would perhaps result in the solder running on the surface next to the tooth.

Dr. RHEIN. I do not think so. I have seen it made that way.

Dr. HINMAN. You have seen them filled from that side?

Dr. RHEIN. No, the matrix had a hole cut through originally.

Dr. HINMAN. You want the solder to be in large pieces. With a big blast blowpipe heat the matrix sufficiently on the under side, so that the entire mass may melt at once.

Dr. CURTIS. Did you ever try having the solder in round balls?

Dr. HINMAN. No. I use the heavy pieces.

Dr. REITZ. There is an electric furnace that is suitable for that purpose. The heat in the muffle is carried to the required point, when the entire mass of solder melts uniformly.

Dr. HINMAN. It may be a satisfactory means, but I have never used it. I thought you meant the method of using little platinum-gold balls for testing the different porcelains.

Dr. CARR. I move that the thanks of the society be extended to Dr. Hinman for his valuable paper.

The motion was unanimously carried.

Adjournment.

Annual Meeting.

THE annual meeting of the New York Odontological Society was held at the New York Academy of Medicine, 17 West Forty-third street, New York city, on December 19, 1905, with the president, Dr. John I. Hart, in the chair.

The officers elected for 1906 were as follows: F. T. Van Woert, president; W. T. Turner, vice-president; W. B. Dills, recording secretary; Ellison Hillyer, corresponding secretary; F. C. Walker, treasurer; C. A. DuBois, curator; W. B. Dunning, editor.

Executive Committee—W. D. Tracy (chairman), B. C. Nash, and R. Ottolengui.

Clinic Committee—R. M. Sanger (chairman), H. W. Gillett, and A. H. Merritt.

Adjournment.

WM. B. DUNNING, D.D.S.,
Editor N. Y. Odontological Society.

THE DENTAL COSMOS
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Devoted to the Interests of the Profession.

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PHILADELPHIA, JULY 1906.

EDITORIAL DEPARTMENT.

DENTAL EDUCATION.

WE present in this issue three articles dealing with various aspects of that perennially interesting and important subject, dental education. All these papers are important in that they embody the views of thoughtful men, who give the conclusions which they have reached as the result of investigation and experience, and it is because of this fact that they are worthy of serious consideration. Critical discussions of the educational problem are the forerunners of improvement; they are evolutional forces which make for the betterment of the system which is the creative element of our professional life. We therefore welcome to our pages studies of this character, especially when presented by unprejudiced seekers after the truth.

There are several points of contention raised by Dr. Talbot upon which opinions may differ. First, as to the present perfection of dental mechanics, and that it is overdone in dental education to the limits of monstrosity. It is true that the development of the mechanical aspect of dental art has been phenomenal, and when one views the intense interest and ingenuity that has been so successfully expended in the creation and adaptation of mechanical devices in dental art, it is perhaps a natural error to fall into in believing that dental mechanics has reached its maximum of development; but the same thought was expressed by Horace Hayden in August 1841, in an address before the second annual meeting of the American Society of Dental Surgeons. When referring to the improvements in porcelain teeth since the time of Chemant and Fonzi, and "the fixtures for obviating the partial or total loss of the teeth," he said, "We have had frequent opportunities of seeing examples of both, and we are free to say that it appears difficult, nay, almost impossible that any further advances or improvements can be made that may be considered a nearer approximation to perfection than that which has been already attained, especially in this our own country." Who that has examined the dental substitutes produced fifty years ago can fail to realize the advance in all essential points that has been made at the present time? With the indisputable record of steady improvement for more than a half-century before us in dental mechanics, he would be a rash prophet indeed who would proclaim that no further advance can be made or will be made.

When, however, we consider the relative emphasis which is given to the study of mechanics and to pathology, with its underlying factors of anatomy, chemistry, and physiology, we have quite another and vastly more important and practical problem in dental education to consider. The difficulty in our educational scheme, as we view it, is not that too much or too thorough training in dental mechanics is given to the student, but that insufficient training is given in the biological subjects of the curriculum. It is because of this disposition that the curriculum lacks balance in fact, even though it may appear to be otherwise in name. This, we take it, is the essence of Dr. Talbot's criticism, for in the suggestions which he offers for improvement of the system and its product, he himself appears to advocate the retention of the present amount of teaching in dental mechanics that the curriculum provides. Any dental teacher of some years' experience knows full well that every hour of time allotted to training in dental mechanics is needed to fit the graduate to perform the usual mechanical operations of his calling with average skill and intelligence.

But the appeal voiced by Dr. Talbot for a better education for dentists cannot be brushed aside by glossing over the facts in the case, or by ignoring them. Nor can the question be disposed of by unduly magnifying the importance of mechanics, and asserting that dentistry is after all a mechanic art. If it is only a mechanic art, then let us be honest, drop our doctor titles and be self-respecting mechanics, and rest content with that. We have, however, come to recognize that dental work involves vital problems, that the teeth, the organs and tissues of the mouth, are parts of the vital economy, and that their maintenance in health and restoration from a state of disease involve procedures and therapeutic measures with which mechanics in a specialized sense is not concerned, and which can only be understood and met by the means known to that department of biologic science which we call, for the lack of a better descriptive term, medicine. The general truth of this proposition is practically recognized by the introduction into the dental curriculum of about all of those subjects that are regarded as fundamental to the study of the healing art. When, therefore, the demand is made that the dentist shall be "medically educated," the reply must be that he is medically educated now if the dental curriculum is to be interpreted at its face value.

But the cry is that the product is defective; that dentists do not know as much of the principles of medical science as they should; that they are lacking in scientific attainment and appreciation of the scientific method; in short, that dental education does not educate. Where, then, is the defect? Is it good educational economics to demand that a man shall pursue his studies preparatory to professional life until he shall have reached twenty-five or twenty-seven years of age before entering upon his active professional career and taking upon himself the responsibilities of self-maintenance? Whatever may be said in favor of such extended preparation for active professional life may apply possibly to divinity, to law, or possibly even to general medicine, but it would be fatal to the making of a dental practitioner of the best type, because—however valuable an intellectual culture may be—it is certain that the man who cannot skilfully use his hands in the actual doing of delicate manipulative work is a practical failure as a dentist, and the necessary manual skill can only be acquired during that period of youthful physical plasticity when the muscular and nervous co-ordination is most impressionable. The pianist, the violin virtuoso, and those who reach eminence in any art requiring a similar type of manipulative skill, have been perforce trained almost from infancy, if they have achieved distinction in later life.

Sir Michael Foster said at the Cambridge meeting of the F. D. I., in 1901, that for many years past he had "urged that the education of the surgeon should not be delayed too long, because it is impossible after certain years to acquire that suppleness and dexterity of touch which are necessary for success. The mind grows old very slowly, and can be educated even late in life; but the body becomes old very soon, and it is necessary to train it while it is really young." What teacher of dentistry is there that has really come into contact with his students who does not know the literal truthfulness of this far-reaching statement made by the distinguished educator and physiologist of Cambridge University.

The vital problems of education in general are at the present time two: First, how best to educate; and second, how to stop the wicked waste of time and energy that is admittedly a defect in our present systems, in which years of time are expended by the student in going through the drudgery of study that does not educate as it should. The defects of which Dr. Talbot complains exist, as every dental teacher knows, but we believe that the etiology of the difficulty has not been fully worked out by him, or he would suggest a different remedy. It is but adding to the wasteful expenditure of time in acquiring an education to attempt to train a mind to intellectual habits through a college course of study built upon a badly constructed foundation of preparatory instruction. The qualities of logical reasoning, of scientific method, of honest interest, of originality of thought, for which Dr. Talbot contends, are intellectual attributes which should have their roots established in the kindergarten, and bear their fruitage in the college or professional school.

The article by Dr. Jarvis, a practical and experienced teacher and drill-master, has hit the weak spot squarely by referring it to the preparatory school. It is generally supposed that the student attends college to finish his education by adding a larger training in selected groups of studies to his preparatory foundation, but it is the general fact that much of his effort in college is directed toward overcoming bad habits of study, and in actually learning how to think instead of memorizing. Culture of the intellect is mainly a development of the power to reason precisely and logically, and it is as normally proper to train that faculty in the infant as it is in the college student. Yet the tendency is to regard training in rational modes of thinking as a process suitable only for mature minds. When the preparatory school system is reconstructed upon more intelligent lines, when preparatory school teachers are selected for their fitness and adequately compensated, there will be no difficulty in converting their product into efficient and scientifically educated dental practitioners with the intellectual attributes which Dr. Talbot and many others rightfully demand.

We do not share the pessimistic views expressed by Dr. Talbot as to either the present status or future outlook of the dental profession ; nor are we in accord with his plan for correcting the evils of which he complains—several of which we do not believe exist at all. When he asks, "Is there nothing new to write about?" and answers it by the assertion, "That will depend upon whether the dentist is mechanical or scientific," he implies a contradiction of ideas. What, may we ask, is there to prevent a mechanic from being scientific or a scientific man from being a mechanic? It is in just this implied misconception that the principal difficulty in dental education lies. And it is this same misconception that is at the basis of the statement favorably quoted by Dr. Talbot from an editorial in the *International Dental Journal*, the essence of which is that "All the talk of which we hear so much regarding extension for prevention is simply throwing dust in the eyes of the modern operator, to prevent him from seeing the records of past history, and reading therefrom that practical results—whether from the use of non-cohesive or cohesive gold—are worth more than a whole decade of theorizing"—and that "notwithstanding the earnest talk of 'extension for prevention.' The good men of 1850 taught the same thing." Concerning which it may be said, the "good men of 1850" doubtless taught a similar method, but they could not have taught the "same thing" for the simple reason that the "same thing" did not exist in 1850. The knowledge which we call bacteriology was then unborn; the etiology of caries was therefore unsolved, and the axiom, which is the parent of the catchy phrase "extension for prevention," could not then have been enunciated, viz, the margins of a filling must be laid upon areas of enamel that are relatively immune to the attacks of caries-producing organisms in order to prevent a recurrence of decay. Several decades of scientific research were needed in order that the foregoing deduction could be made possible. The "good men of 1850" may have known how to shape and fill cavities, but the good men of today know why, and the difference between the how and the why, in this case at least, is just the difference between empiricism and science.

Every earnest teacher of dentistry painfully realizes the need for a better educated student material in order to convert it into a better educated professional product; but by "better educated" is by no means meant the individual who has spent the most time in study, or who has studied the largest number of preparatory branches. It is kind and character of training that counts most toward education. Education is the process by which culture is produced, and culture is the reflex of education in character; knowledge is the means to the end. If the mere knowing about things be education, it were less costly in time, money, and effort to keep an encyclopedia for ready reference, as it contains more recorded knowledge than is likely to be found in any human brain.

Dr. Trueman has clearly set forth the importance of the kind and character of training as being of much greater practical moment than the time element. We need to clearly define what we mean by "higher standards" before we rush blindly on to the adoption of any standard that is wasteful of time and does not produce a cultural result that is commensurate with what it costs.

We think Dr. Talbot's view of the conditions of dental progress is in general incorrect. We are certainly not in a state of professional stasis. We do not believe there is nothing new to write about, nor are we able to imagine the "etiology" of his astounding statement—with respect to "irregularities of the teeth" and "interstitial gingivitis"—that "not a single article has ever been written upon the pathology of either subject." We have kept in rather close touch with dental literature for the past quarter of a century, and while the growth of the scientific *motif* in our work has not, we confess, progressed as rapidly as we could wish, nevertheless it has grown and is growing increasingly; and while its development either as to kind, amount, or direction may not exactly harmonize with the cherished notions of any one propagandist, the great and soul-satisfying feature is the fact that it does, after all, progress.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by **JULIO ENDELMAN, D.D.S.**

[*Transactions of the Odontological Society of Great Britain*, London, April 1906.]

CYST OF THE ANTRUM. By T. S. Carter, L.D.S.

The case to be described came under the observation of the author at the Leeds General Infirmary. The patient was a child, aged twelve and one-half years, and was admitted to the infirmary with a swelling of the left cheek, previously believed to be of sarcomatous nature. The cheek was much distended, had a rounded feeling, and an appearance indicating a distended antrum or a malignant disease. There was absence of pain and of nasal or oral discharge. The deciduous teeth were *in situ*, but neither the permanent first and second molar nor the canine had erupted, although at the time of the examination these were respectively three and a half, two and a half, and one year overdue. Mr. Carter made an examination under ether, and after removing the deciduous teeth, found that a scalpel could be pushed through the floor of the antrum, which was quite soft and yielding. This gave rise to a dark-colored discharge mixed with pus. On searching with the probe, the crowns of two teeth—which turned out to be a malformed bicuspid and also the undeveloped second bicuspid—were found high up in the antrum. The antrum was treated with carbolized oil, and ultimately a drainage tube was fixed. The swelling eventually subsided, and the patient recovered completely.

[*L'Odontologie*, Paris, May 15, 1906.]

CAPPING OF THE PULP. By F. H. Anjubault, Paris.

The author has studied the causes of failure with the capping method of treating pulps, which he attributes to either one or to a combination of two or more of the following factors: First, degeneration of the structural components of the organ; second, systemic weakness of the subject (diminished vital resistance); third, incomplete disinfection; fourth, compression of the organ.

Group I. All practitioners are agreed with reference to the impracticability of pulp-capping when the organ is in a state of even incipient disintegration. Any attempt at the re-establishing of function in such a pulp results almost invariably in failure. In this group of the causes of failure in pulp-capping may also be included a hyperemic condition prior or during the application of the treatment and dressings with coagulating medicaments.

Group II. In aged patients, in those suffering from any particular diathesis—or in other words, in all subjects in whom the metabolic equilibrium is disturbed—pulp-capping is contra-indicated, as under such circumstances, the circulation being sluggish, the pulp fails to receive from the blood-current the elements necessary for its functional rehabilitation.

Group III. Incomplete disinfection is the most frequent cause of failure. In this connection the author recalls the investigations of Choquet on the sterilization of the dentin and pulp. This investigator has found that the ordinary method of dentin disinfection, which consists in wiping a cavity with a pellet of cotton saturated with a disinfectant, does not bring about to any extent whatever the results sought after.

Group IV. If the cavity be filled with an elastic material, such as gutta-percha, in all probability the pulp will be compressed as the result of the pressure necessary to insure an impervious filling, and therefore the author is of the opinion that filling materials requiring pressure for their introduction in the cavity should be excluded.

The method of capping pulps which the author strongly advocates, it having been in his hands the means of saving many a pulp, is as follows: The cavity is freed of as much disorganized matter as it may be possible to remove without injuring the pulp, being especially mindful of the condition of the dentin at the margin of the exposure. If a layer of softened dentin be found overlying the pulp, it should be left undisturbed if by its removal further injury to the pulp might be inflicted. The cavity is now thoroughly washed with lukewarm chloroform water, and carefully mopped with absorbent cotton. Into the cavity, and upon the exposure if there be one, a pellet of cotton slightly moistened with the following solution is applied:

℞—Thymol,	gr. xv;	
Oil of cloves,	ʒj;	
Chloroform,	ʒj.	M.

Sig.—Cavity disinfectant.

Over the dressing thus placed a filling is inserted, prepared by mixing sublimed zinc oxid with eugenol to the consistence of very soft putty. The antiseptic dressing is allowed to remain in contact with the pulp for several days, in order that the organ may receive the full effects of the antiseptic solution. The soft filling and antiseptic dressing are then removed, and the cavity re-filled with the zinc oxid-eugenol paste. After the cement has thoroughly hardened the superficial portion of the filling is removed, and replaced by amalgam, tin, or gold.

[*La Estomatologia*, Madrid, May 1906.]

TREATMENT OF THRUSH. By Ramon Pons.

Thrush, which is peculiarly a disease of children, is caused, not as the author states by the oïdium albicans, but by the saccharomyces albicans, which according to Miller ("The Micro-organisms of the Human Mouth," Philadelphia 1890), "was formerly classed among the mold fungi, and called *oïdium*. Numerous experiments made by Plaut, Klemperer, Bazinsky, Grawitz, Rees, etc., point, however, to the conclusion that the fungus of thrush is not a mold, but a bud-fungus, a view now adopted by most mycologists, while others accord to thrush fungus a place in the class of the Torulaceæ, *i.e.* a middle position between the typical yeast and mold fungi." In children, either a decrease in vital resistance through disturbed nutrition or lack of hygienic care, particularly in those artificially fed, are usually the predisposing causes. In adults, aphthous stomatitis frequently develops after long attacks of illness.

After describing the symptomatology of the diseases the author gives some valuable advice regarding the treatment thereof. The practitioner should first of all endeavor to improve the systemic condition of the patient, in view of re-establishing normal metabolic equilibrium as far as possible. The mouth should be constantly maintained in a condition of strict cleanliness, which may be successfully accomplished by frequently cleaning the child's mouth mechanically with the aid of a finger around which aseptic cotton has been wound, and which subsequently is immersed in a mild alkaline antiseptic. Sugar, honey, and syrups should be omitted from preparations to be employed in the treatment of thrush, as the saccharomyces albicans thrives successfully when in a medium rich in carbohydrate constituents, while on the other hand alkaline solutions are inimical to its development. Besides topical applications with any one of the following solutions, the patient's mouth should be frequently rinsed with any of the alkaline table waters, such as vichy, lithia, etc.:

Topical applications.

No. 1.

℞—Sodium borate,	ʒj;
Glycerin,	ʒij;
Water,	℥j.

No. 2.

℞—Sodium bicarbonate,	ʒj;
Sodium borate,	gr. xxx;
Glycerin,	ʒv.

No. 3.

℞—Silver nitrate,	gr. v;
Distilled water,	℥j.

No. 4.

℞—Mercuric chlorid,	gr. ½;
Alcohol,	ʒij;
Distilled water,	℥j.

No. 5.

℞—Potassium permanganate,	gr. iv;
Distilled water,	℥j.

No. 6.

℞—Zinc sulfate,	gr. xx;
Rose water,	℥j.

[*Deutsche Zahnärztliche Wochenschrift*, Berlin, May 12, 1906.]

DIONIN. By Dr. F. Walther, Leipzig.

Dionin is the hydrochloric acid salt of mono-ethyl-ether of morphin. It is an odorless, white, crystalline powder of bitter taste, soluble in water. It is employed *per os* and also hypodermically. It is a substitute for morphin, possessing over the latter the advantage of inducing no unpleasant after-effects. Employed as an hypnotic it induces sleep which lasts from one to six hours. In adults it is administered in the powder form, in doses of from two to four centigrams (gr. ⅓-⅔), three to four times daily, or hypodermically in solutions of from one to eight per cent. For children it is given every three hours in teaspoonful doses, of a solution varying in strength from ½ gr. to four ounces of water, to 1½ gr. to eight ounces of water, the latter dose being for children over four years of age.

[*Revue générale de l'Art Dentaire*, Paris, April 1906.]

THE ASSUMED INNOCUOUSNESS OF THE ETHYL AND METHYL DERIVATIVES. By Mons. A. Barden.

The use of a general anesthetic in dentistry in this essayist's opinion is but rarely indicated. There is little doubt in the reviewer's mind that the author did not intend that the foregoing statement should apply to the use of hyponitrous oxid in connection with dental and minor surgical operations—for any agent with as splendid a history and with a mortality record of less than one case per 300,000 operations could not be consistently regarded as the source of probable danger. As a matter of fact, in so far as safety is concerned nitrous oxid heads the list of all available anesthetics, not excluding such agents of the local group as cocain and its synthetic compounds and derivatives. General anesthesia he would employ when in the judgment of the operator the extraction may give rise to a mandibular trismus, in the extraction of impacted teeth requiring a true surgical operation for their removal, and in cases where a relatively large number of teeth are to be extracted. In operations other than those above referred to the author strongly denounces the use of such general anesthetics as chloroform, ether, and the ethyl and methyl derivatives. Regarding the last two groups of anesthetics the author shows that entirely too much confidence has been placed upon the innocuousness of ethyl chlorid, which according to the statistics collected up to date and referred to in the present article, is responsible for twenty fatal cases.

[*Transactions of the Odontological Society of Great Britain*, London, April 1906.]

TEETH DEVOID OF ENAMEL. By Mr. N. G. Bennett.

The case reported by Mr. Bennett was that of a girl aged fourteen, whose teeth are extremely deficient in enamel, and probably entirely devoid of it in some respects. All the teeth are of a dark brown color. The clinical history of the child is as follows: There is a syphilitic history. The child was breast-fed, and for the first six months appeared healthy. The deciduous teeth are said to have been of the same brownish color. She frequently had convulsions, and teething powders were given occasionally. She had measles when two years of age, and has been delicate all her life. There is one brother and one sister living, and they have teeth which are sound and good, and very white. Two sisters who died, one at three and one at seven, are said to have had teeth resembling the teeth of this child.

The interest of the case, says Mr. Bennett, lies in the etiology, because it differs entirely from those cases of so-called hypoplasia, which grouped themselves into two classes. In the first class, the first molars, the cutting edges of the incisors for about one-eighth of an inch, the points of the canines, sometimes the lateral incisors, and more rarely the premolars, are affected. These cases are always due to errors in feeding during the first six months of life. They are usually associated with convulsions, but are not as a rule connected with any one particular disease occurring at a particular period. The second class of cases is quite distinct, and in this the horizontal lines are found across the teeth, especially in the upper incisors and laterals, about half-way between the cutting edge and the gum margin. The history of these cases invariably reveals the occurrence of an attack of illness—usually some one of the eruptive fevers—at some period of life from two years of age onward. The case under consideration is quite distinct, because no attack of illness seemed to have occurred during the developmental period of the affected teeth.

[*British Journal of Dental Science*, London, May 1, 1906.]

STOMATITIS IN CHILDREN. By Frank J. Pearce, L.D.S., England.

Stomatitis is best defined as an inflammation of the mucous membrane of the mouth; in some cases it is limited to the gums, when it is termed gingivitis; or to the tongue, when it is called glossitis; but when seen in children it is seldom limited to any one portion of the mouth.

Among the causes predisposing to this disease are undoubtedly malnutrition and unhealthy surroundings, and the former may be due either to lack of sufficient food, or to the unsuitable character of the food. Another predisposing cause is anything which causes the retention of the waste products of the body.

The presence of some other disease or diseases may also act as the predisposing cause of stomatitis. We cannot as yet state that micro-organisms are in all cases the exciting cause, though they probably act as a factor in all cases; in some cases directly as the cause, as in thrush, and indirectly in others, as a means of spreading the disease to the surrounding tissues. There are always a great number present in the mouth, where they find, in the food, moisture, and temperature, favorable conditions under which to flourish.

Besides the ferments of bacteria, another form of ferment which acts as a direct cause of stomatitis is due to the decomposition of food taken into the mouth, an acid being produced which has an irritating action on the mucous membrane. This is a very frequent cause in early life; the mother, either through lack of knowledge or carelessness, neglects to cleanse the child's mouth after each meal, consequently the residue clinging to the mucous membrane undergoes fermentation. Another frequent cause in early life is a dirty feeding-bottle or nipple.

The importance of early treatment of these cases in children cannot be overestimated when one remembers that the permanent teeth are being formed and calcified under such unfavorable conditions. We are all familiar with the appearance and structure of teeth which have been developed during some arrest in the nutritional functions of the part, due either to some local stomatitis or other constitutional disease. Another reason for early treatment, if one were needed, is that all food taken into the mouth becomes infected, and in this way infection is carried to the stomach, causing derangement of the digestive organs and thus interfering with the nourishment of the body as a whole.

For convenience the author divides stomatitis in children into two main groups: First, cases that are of a catarrhal nature; secondly, those that are ulcerative, and may lead to destruction of the tissue—in some cases very extensive.

This is not, strictly speaking, a classification, as the catarrhal form may become ulcerative and lead to destruction of tissue.

Catarrhal stomatitis may be divided into those that have a local origin, and to which one can usually assign a local cause, and those that appear to have been caused through some disturbance of the general system—usually the gastro-intestinal tract, though it is difficult to decide whether the gastro-intestinal trouble is in all cases the cause or the effect. The local causes which may bring about a catarrhal stomatitis are numerous.

During eruption, more especially of the deciduous teeth, the child becomes hot and feverish, and the mouth is red and swollen and very tender, accompanied by either an increased flow of saliva or an unusual dryness, and in severe cases this is accompanied by other symptoms which may lead to convulsions unless relief is given. Later in life stomatitis is caused by the presence of teeth with dead pulps. One or two cases which the author has observed have been caused by some substance rubbed on the gums as a supposed cure for toothache, and although it appeared to have only been applied to the gum around the aching tooth, an extensive inflammation spreading over the whole of the gum and mucous membrane of the cheek on that side of the mouth was caused.

It may also be caused by the spread of an inflammation from the throat or nose. For the treatment of any excessive inflammation during eruption, the author is strongly in favor of lancing. He is aware, he says, that many people object to this operation, but the relief is so great and so immediate that the advantages outweigh the disadvantages; in fact, the only disadvantages are hemorrhage and the chance of a cicatrix forming before the tooth is through, and thus delaying the eruption or altering the course. Regarding cicatrix formation, the author, in the reviewer's opinion, seems to have lost sight of the fact that cicatricial tissue, being less highly organized than normal tissue, must perforce be also less resistant than normal gum tissue, and consequently cannot consistently be regarded as an objection to gum lancing.

When stomatitis is due to the presence of diseased teeth, the author removes them and prescribes an antiseptic mouth-wash. Where the cause is constitutional the child should be sent to see a physician and a mouth-wash prescribed. In most cases a mild purgative is of advantage, and milk of magnesia is a very good one, as it neutralizes any acidity present, is soothing to the tissues, and with the acid of fermentation forms a magnesium salt, which acts as a laxative.

The best mouth-washes are boric acid, ten grains to the ounce of water; or a three per cent. solution of hydrogen dioxid yielding ten volumes of oxygen. Potassium chlorate or permanganate are also of use in these cases.

Ulcerative stomatitis is very common, especially in weak, unhealthy children; but it is also met with in children who appear to be in the best of health. It usually starts in the front of the mouth and more frequently in the mandible, as a ragged ulcer of a grayish-white color on the surface, the gums around the ulcer being congested and swollen, and unless treated the ulceration spreads rapidly along the gum margin to the back of the mouth. The mucous membrane of the cheeks soon become ulcerated, the lymphatic glands become swollen, and the teeth loosen. Later the alveolus is attacked and becomes necrotic, leaving the roots of the teeth bare until they also become necrosed. There is very little, if any, pain at first, but later it becomes very painful; there is an increased flow of saliva, which is mixed with mucus, and the breath becomes very offensive. In the later stages it may be accompanied by constitutional symptoms, and it is due to these and the fetor of the breath that the condition is noticed, and the child brought for treatment. This disease seems to be communicable from one child to another, probably through their sharing some food, such as an apple, or by sucking the end of a pencil, or any of the other things that children are likely to put in their mouths.

The treatment consists in giving potassium chlorate internally, and in the use of mouth-washes of the same drug. For children up to the age of four, three grains every four hours may be prescribed; but in older patients the amount may be increased up to ten grains, approximately a grain for each year of the child's life, although the smaller dose is sufficient in slight cases. This drug appears to be a specific for this disease, and little other treatment is usually required, besides the removal of septic teeth. In severe cases, however, a local application is advisable, such as equal parts of dried alum and tannic acid rubbed on the ulcerated surface.

Another ulcerative form is met with in scurvy. The gums are of a dark-red color, soft and swollen, with here and there red, glistening patches, which break down and coalesce, forming an ulcer, white on the surface, due to the death of the epithelium. A distinctive feature of this form is the contrast between the dark red, almost purple condition of the gums, and the bloodless appearance of the lips. Besides the local signs, the child is extremely irritable and has no desire for food—any that is given has to be almost forced down. In this connection it may be of value as a diagnostic sign to mention the dark-blue spots, very much like bruises in appearance, which are noticeable upon the limbs of scorbutic children. This sign, although not mentioned by the author, deserves more than passing attention.

The limbs are usually flexed. This condition is met with in children brought up on unsuitable food, such as unsterilized cow's milk, and if not treated may lead to destruction of tissues. The treatment consists mainly in the administration of suitable food, and if the child is fed on cow's milk it should be sterilized and a little lime-water added. Later the child may be given the juice of ripe fruits, and a little raw meat juice. Local treatment is confined to the use of antiseptics to bring the mouth back to a healthy state, and the mother should be given instructions to carefully wipe out the mouth periodically with some dilute antiseptic.

After referring to aphthous and follicular stomatitis, the author discusses gangrenous stomatitis (cancrum oris), which fortunately is of only rare occurrence. It is said to occur in weakly, ill-fed children, and more commonly in those recovering from fevers, especially measles. It appears in children from two to six years of age, either as an ulcer at the junction of the cheek and gum, or in other cases as a severe stomatitis without the primary ulcer. The cheek becomes swollen, hard, and livid, and the mucous membrane breaks down, leaving a large, black slough which extends toward the back of the mouth, until the whole cheek and jawbone become involved, and may be entirely destroyed in a few days. In most cases the disease is fatal in four or five days.

[*Revue générale de l'Art Dentaire*, Paris, April 1906.]

DIFFERENTIAL DIAGNOSIS OF TRIGEMINAL NEURALGIA. By Dr. Guerard.

After reviewing the anatomical characteristics of the trifacial nerve, the author enumerates the pathological conditions of buccodental origin capable of causing neuralgia or disturbances simulating this disorder. Incidentally the author recalls the areas in which the pain in trifacial neuralgia is most likely to become localized. These "neuralgic points" in the maxilla are the infra-orbital, malar, upper lateral, dental, and palatal, and in the mandible the mental, auriculo-temporal, labial, lingual, and dental. In the etiology of trifacial neuralgia one of the most important factors to be considered is dental caries. Next in importance follow the pathological evolution of the third molars, odontomes, neuritis, osteo-periostitis, osteo-myelitis, and necrosis of the maxilla or mandible. In edentulous people the clinician should bear in mind that neuralgia is frequently caused by compression of the nerve filaments of the alveolar border through osseous deposition. Inflammatory disturbances of the maxillary sinus may likewise be the source of neuralgia through compression of the twigs from the posterior superior dental branches which supply the lining membrane of the sinus. A differential diagnosis between trifacial neuralgia and pain due to such causes as hypersensitive dentin, exposed pulps, etc., is entirely too elemental a feature of dental pathology to require any reference in this review, although one phase of this question is of especial importance to the patient, namely, reflex pain due to compression of the pulp by calcific formation, which can be diagnosed only by a process of careful exclusion. Trifacial neuralgia should not be confounded with hysterical cephalalgia, migraine, temporo-maxillary rheumatism, cutaneous hyperesthesia, tic douloureux, infection, auto-intoxication, diathetic manifestations, etc.

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PERISCOPE.

Renewing Zinc.—When zinc used for dies becomes thick and does not pour well, melt to dull red heat and add a tablespoonful of strong hydrochloric acid while stirring.—*Dental Register.*

Mummifying Root-Canal Filling.—A mummifying root-canal filling that has been recommended consists of a liquid composed of equal parts of formaldehyd and creasote, and a powder consisting of 5 parts thymol, 12 parts dry alum, and 40 parts zinc oxid. If the liquid should be cloudy a few drops of alcohol will clear it.—*Stomatologist.*

Cavity Margins for Inlays.—Every portion of the cavity, and in particular the edges, should not only be well shaped, but brilliantly polished. With small Arkansas stone points a beautiful finish can be obtained, which should extend over the edges, giving everywhere in the neighborhood of the cavity a polished surface from which it is easy to remove the matrix. It is folly to attempt making a perfect matrix against a sharp, uneven, or rough edge; or to expect always to remove it without accident from a cavity around which rough surfaces have been left.—N. S. Jenkins, *Elliott's Quarterly.*

Formula for Liquid Flux.—The best liquid flux that I have ever used, which I compound myself and find ever ready and faithful, is—

℞—Boric acid,
Borax. āā ℥ss;
Ammoniæ muriat., gr. xij;
Pot. carb., gr. v;
Aquæ dest. q. s. ad ℥iv. M.

It will keep indefinitely and can be used on any metal for hard soldering. It should not be used, however, in connection with porcelain.—H. E. Davis, *Dental Era.*

Lead and Opium Wash.—The well-known lead and opium wash (*Journal American Medical Association*) has long been popular as an external wash, and justly so. A mucilaginous liquid could be used in the place of the tincture of opium without detriment, since it is the astringency of the lead which is desirable—the local application of the opium alkaloids being superfluous as they are not absorbed by the skin. The following mixture will probably answer the purpose for which the laudanum and lead-water are commonly used:

℞—Liq. plumbi subacetatis, gr. lxx;
Mucil. acaciæ, gr. xiv;
Aquæ q. s. ad ℥iij. M.

The solution of lead subacetate is diluted with 55 cc. of water and the mucilage with 27 cc.; the two are then mixed. Alcohol 15 cc. may be added to the water, but the amount of alcohol present in the mixture of laudanum and lead-water is too small to be of any benefit.—E. S. M'Kee, *Lancet-Clinic.*

To Remove Rust from Instruments.—*Pharmaceutische Centralblatt* prints an effective process for removing rust from surgical instruments. The instruments are placed over night in a saturated solution of stannous chlorid, which causes the spots to disappear by reduction. The articles are then rinsed in water, laid in a hot solution of soda soap, and dried. It is well to rub them with absolute alcohol and prepared chalk. Another convenient method for removing rust is to lay the instruments in kerosene. Paraffin oil is the best preservative against rust, and the most convenient way of applying it without getting an unnecessarily thick coating is as follows: One part of the oil is dissolved in two hundred parts of benzine, and the objects, after being thoroughly dried and warm, are plunged into the solution. Instruments with joints, as scissors or needle-holders, are washed in the fluid, in order to cause it to penetrate into all crevices, and the benzine is then allowed to evaporate in a dry room.—*British Dental Journal.*

Restoring Broken Crown Facings.—Grind or clip the pins of the late facing flush with backing. With a lubricated drill make holes through the backing to suit the pins of the new facing. This preparation guides the facing to place, which will be useful during the grinding required to fit the backing. Use thin carbon paper for the fine adjustment of the facing. Bend the ends of the pins to form loops and invest the facing preparatory to uniting the pins with gold or silver solder. While the investment dries and heats, finish preparation of the backing. A U-shaped slot is cut with a small dental fissure-bur, starting in the pinholes already made, and thus making a tongue around which the loop of the facing will fit. A pear-shaped or round bur, not too sharp, will cut away enough of the tongue from the palatal side to allow the loop to go to place. Lubricate the bur with vaselin or glycerin.

Having soldered the pins of the facing it will be cool enough now to try it in place for fine adjustment. Cement the facing to place, holding a piece of unvulcanized rubber against the palatal aperture to prevent the cement from being forced through the opening. A small ball of soft amalgam at hand quickly closes the aperture in the backing and keeps the loop immovable. The advantages of the method are security of facing, accurate adjustment, and an unweakened dowel in the crown.—W. G. L. Spaulding, *Dominion Dental Journal.*

Obtunder for Sensitive Dentin.—I desire to call attention to a practical prescription, and in doing so it is my intention to emphasize the pharmacy involved in the combination of these various drugs, as well as to describe their dental and therapeutical application:

℞—Menthol, gr. xx;
Chloroformi, fʒj;
Etheris, f℥ss. M.
Sig.—Use as directed.

The above prescription is one that can be used for obtunding sensitive dentin. It is not a panacea for all ills. It will not completely desensitize all dentin, but in large cavities where there is an extensive area involved and where the dentin is extremely sensitive, by placing a little pellet of cotton—saturated with this liquid—in the cavity after the rubber dam is adjusted, it will be found that by the time the dentin has been excavated, these two extremely volatile liquids, ether and chloroform, have volatilized. The value of this remedy depends largely upon the volatilization of these fluids. No solid can turn to a liquid, and no liquid to a gas, unless according to a certain law in physics by extracting a certain amount of heat; and as these two liquids are volatilized there is abstracted from the tooth-structures a certain amount of heat, and that volatilization drives the menthol into the decayed dentin. You cannot remove the decay painlessly in all instances, but you will be surprised to find at times how painlessly you can remove it after you use this remedy.—J. P. BUCKLEY, *Dental Review.*

A Wasteful Lot.—Dentists are ever ready to complain of the non-remunerative character of their work, charging it up to want of appreciation on the part of the public, the public's inability to place a fair value on the service rendered, and what not. These, with other not easily controlled causes, carry more or less weight in accounting for the chronic impecuniousness of the vast majority of the profession. There are other causes, however, and not the least is our proverbial wastefulness. We have seen dentists, whose financial status was such that they couldn't afford to waste a nickel, throw small clippings of gold on the floor, scatter filings of the same metal about the bench and chair, sweep the grindings of a crown or bridge from the lathe table, and wonder withal why they had failed utterly to get a dollar to the good.

A jeweler in the operating chair happened to see a scrap of foil on the floor, and asked, —naturally enough for him, for he works in gold—"What do you do with your 'sweeps,' doctor?" He got for an answer: "Oh, they don't amount to anything; thrown into the rubbish can, I guess." "That may be well enough for you, but if I couldn't get a suit of clothing a year out of what you seem to waste I'd be greatly disappointed. You men have no appreciation of the value of gold, except perhaps when you buy it."

At a meeting of a near-by local society Dr. F. M. Rood, in a side discussion of this very subject, said he had recently sent to a refiner four ounces of polishing strips and disks, for which he received two dollars and forty cents; had he offered the strips to any one of the majority of those present at ten cents a pound it is a question if the offer would have been accepted. And yet the poor men of the profession are throwing away annually strips, disks, filings, clippings, grindings, etc., by the thousands of pounds, a suggestion of which, if done by an employee in a manufacturing jeweler's establishment would lead to manslaughter in the first degree. And yet we go on wondering why we have to wear last year's hat, shoes run down at the heel, and trousers bewhiskered at the ends of the legs!—*Dental Office and Laboratory.*

HINTS, QUERIES, AND COMMENTS.

THYMOPHEN.

EQUAL parts by weight of crystallized carbolic acid and thymol crystals rubbed together in a mortar or combined by gentle heat in a beaker or porcelain dish results in a fluid of oily consistence similar in physical characteristics to the well-known campho-phénique. It is without escharotic properties, does not coagulate the cuticle when applied topically, and has high germicidal efficiency. The peculiar value of thymol in the treatment of exposed pulps, even when superficially infected, is well known, and has been the subject of scientific study as well as of practical observation for several years. Solutions of thymol have not heretofore been of much utility in dental practice, owing to the lack of a suitable menstruum; hence the virtues of thymol as a root-canal dressing have not been as practically available as they should be. The combination here recommended, and which the writer has taken the liberty of designating as thymophen, is an ideal medicament for use as a canal-dressing, taking the place of campho-phénique or the essential oils, because of its diffusibility, its sedative, non-irritant, and superior germicidal properties. A large clinical use of the preparation is the writer's warrant for strongly recommending it to the dental profession.

EDWARD C. KIRK.

Philadelphia.

OBITUARY.

CHARLES WESLEY STAINTON.

DIED, at his residence 47 N. Pearl st., Buffalo, N. Y., June 6, 1906, CHARLES WESLEY STAINTON, M.D.S., D.D.S., in the sixty-eighth year of his age.

Dr. Charles Wesley Stainton was born on a farm in the town of Castile, Wyoming county, N. Y., two miles southeast of the village of Perry. He was the son of Rev. John and Lydia Griswood Stainton, both of whom came to this country from England in about 1819, and were among the early settlers of that part of Wyoming county.

Charles Wesley was born December 9, 1839, and was the fifth son of a family of ten children. He lived with his parents upon the farm and attained his majority there. He was educated at the Perry Academy, an institution whose subsequent history and progress he always watched with more than ordinary interest.

Soon after reaching manhood he became ill, and having been threatened with tuberculosis, upon the advice of his physician left the farm and canvassed the country with horse and wagon in securing the sale of a household appliance then on the market. This outdoor life and activity proved in his case conducive to health, and he soon recovered. This business experience gave him new ideas as to his life-work. He was attracted toward the drug business at first, but as he could find no opening which seemed desirable after investigation, soon afterward abandoned the idea.

In October 1864 he entered the office of Quigley & Daboll, practitioners of dentistry in Dansville, N. Y. Here he remained over a year, and gained during that time much valuable information and experience.

On January 1, 1866, Dr. Stainton opened an office in the village of Alden. In July 1867 he opened an office in the village of Lancaster, which received his attention one-half of the time, while Alden occupied the other half. Subsequently he gave up the Alden office and thenceforth devoted all of his time to the Lancaster office until his removal to Buffalo. Before this time, however, having become dissatisfied with his acquirements, and being convinced that some broader and more comprehensive knowledge of dental science was desirable if not necessary for his future success, he decided upon a plan of study which he conscientiously carried out. During the winter of 1870-71 he matriculated in the Medical Department of the University of Buffalo, where he attended a course of lectures. The following winter he spent at the Pennsylvania College of Dental Surgery in Philadelphia, and was graduated from that institution in March 1872. In June of the same year he presented himself before the Board of Censors of the Dental Society of the State of New York at Albany, and received the degree of Master of Dental Surgery—"M.D.S."

On October 1, 1872, Dr. Stainton removed to Buffalo, and took charge of the practice of Dr. S. P. Southwick, on Niagara st. near Main, as the latter had become interested in the manufacture of illuminating gas. In May 1875 he moved into the office of the late R. G. Snow, 31 Church st. From thence he removed to 476 Main st., where he remained about two years. Subsequently to this he occupied for about four years an office at 33 Court st. In November 1892 he moved into the house 47 N. Pearl st., where he remained in practice until his death. Dr. Stainton soon built up a lucrative practice. His *clientèle* included many of the better families of the city, who became strongly attached to him as their acquaintance matured. He was a man of good judgment, kind-hearted, genial, and conscientious. Few men in our profession enjoyed a larger circle of friends and acquaintances.

Dr. Stainton became connected with the Dental Association of Western New York in October 1867; it met at that date in Lockport, Niagara county. This was his first introduction to professional gatherings. In October 1868 he also became a member of the Eighth District Dental Society. This society dates its birth June 2, 1868, and Dr. Stainton thus explains the reason of his failure to attend the meeting at which the society was organized. He writes: "It has always been a matter of regret that I was not a *charter* member of the Eighth District Dental Society. I fully expected to be, and repeatedly promised Dr. Whitney that I would be present. I was living in Lancaster at that time, and went down to the Erie Railroad station to take the train, but found to my chagrin that a new time-table, taking effect the previous Sunday, put that train forty minutes earlier. I was left."

Early in its history Dr. Stainton was elected a delegate member to the New York State Dental Society, which position he held for several years. In 1876 he was elected president of the Eighth District Dental Society, and became its treasurer in 1879, being continued in that office for twenty years. He became a permanent member of this society in 1898, and has served it in the capacity of treasurer for seven years. His first appearance in the Dental Society of the State of New York was in 1872, when he made application to the Board of Censors for an examination for the degree of M.D.S., which that society then conferred. Upon taking up his residence in Buffalo in 1872 he connected himself at once with the Buffalo Dental Association, and was elected its president in 1875. Subsequently he served the same organization as treasurer for fourteen years. Dr. Stainton became a permanent member of the National Dental Association several years since, although he had attended the meetings of that body as delegate previously, and was always deeply interested in its proceedings.

Dr. Stainton was an interested, influential, and efficient member of the above dental organizations. He was a power in every movement connected with the progress and development of these bodies. He was ever ready to contribute either with essay or demonstration, and many of his contributions have appeared in the dental journals. He enjoyed the confidence of his professional brethren, who being assured of his honesty and correct habits, elected him and re-elected him as treasurer. He served the several bodies with which he was affiliated in the capacity of treasurer for forty-one years, and was treasurer of the Dental Society of the State of New York at the time of his death, having been recently re-elected.

In his intercourse with his dental *confrères* he was always kind, courteous, and profoundly respectful of their opinions. In debate he was especially strong, as he invariably espoused the side of honesty and justice as it was presented to him. He was firm, fearless, and resolute when he waged war against a measure involving any error in principle or idea, thus being in fact no mean antagonist. He was a true friend, being large-hearted, unselfish, and sincere.

Dr. Stainton early in life manifested a fondness for vocal music, and as soon as the opportunity to cultivate this gift presented itself he improved it. He had been a member of several of the musical circles of the city at different times, and took part in a number of public concerts.

He was an earnest and enthusiastic supporter of the Methodist Episcopal Church. He organized and directed the music—part of which was instrumental—in the Sunday school of the church with which he was connected for a long period, and conducted the singing in the weekly meetings for prayer and conference. He had charge of the ushers at the Sunday services, and had been a trustee of the church for twenty-five years. His Christian life was characterized by devotion, earnestness, and good work, in which charity and grace were predominant.

On January 26th Dr. Stainton accidentally swallowed a mouthful of strong aqua ammonia, supposing that he was using a harmless mixture. The strong caustic scalded the mucous membrane and temporarily destroyed his voice. Not long afterward he contracted a severe cold, which developed a severe and uncontrollable cough, requiring him to take to his bed. Alarming cerebral symptoms soon after appeared, and he gradually but steadily declined until June 6, 1906, when the end came.

Dr. Stainton was united in marriage to Sarah Waith, daughter of Rev. Wm. Waith of Lancaster, on November 4, 1875. He is survived by his wife, two daughters—Ruth L. and Edna—and one son, Wm. Waith. He leaves also three brothers, viz, Robert, Henry B., and Wm. F., all of whom live in or near the village of Perry, Wyoming county, N. Y.

S. A. F.

DENTAL COLLEGE COMMENCEMENTS.

COLLEGE OF PHYSICIANS AND SURGEONS, DENTAL DEPARTMENT.

At the annual commencement exercises of the Dental Department, College of Physicians and Surgeons, San Francisco, Cal., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Herman H. Amelung
George Henry Bartmann
George D. Boynton
Henry Milan Brown
Augustus G. Colburn
Lee R. Clark
Foster Milton Dye
C. H. Edgar
Charles V. Gallagher
A. Warren Gilmore
Edward Clifford Glatt
Frederick William Herms
Edward George Heyn
Charles Goodall Lee
Harry Garret Martin
Sanford Winfield Miller
Emile Henry Morris
William Russell
Edwin S. Scott
Ralph Henry Sheppard
Henry Harrison Taylor
Makiji Utsumi
Albert Sidney Vanderhurst
Edward Everett Vicary
James Ransom Walden
Andy C. Wallace
Charles Worthington Wilson
Tatsuo Yamamoto
Kingpo P. Yip

ATLANTA DENTAL COLLEGE.

The annual commencement exercises of the Atlanta Dental College were held in the Grand Opera House, Atlanta, Monday evening, April 30, 1906.

The valedictory was delivered by C. B. Baker, D.D.S.

The degree of Doctor of Dental Surgery was conferred by Hon. W. R. Hammond on the following graduates:

A. J. Anderson
C. B. Baker
W. B. Barbour
W. S. Barefield
A. Benbow
D. C. Bradford
E. H. Broughton
P. F. Brown
W. S. Bryson
R. T. Burnley
H. Cannon
M. A. Carter
Van D. Casteel
L. Colson
E. E. Dedge
B. F. Duke
E. P. Durant
G. M. Feagin
J. H. Gettys
H. B. Gibson
R. F. Graham
R. H. Green
J. W. Hamer
W. B. Hansard
L. K. Howle
B. B. Hudson
H. Jensen
J. A. Key
R. H. Kinabrew
W. S. Knight
E. W. Lott
B. W. Miller
J. S. Morgan
G. C. Murrah
M. D. Nesmith
G. T. Newell
L. J. Priebatsch
W. L. Ricker
M. P. Shirley
R. F. Sox
S. C. Stutts
J. M. Swicegood
R. E. Tiller
F. E. Webb
J. W. Whitley
R. H. Wilds
J. A. Young

MEHARRY DENTAL COLLEGE.

The thirtieth annual commencement exercises of the Meharry Dental College (Walden University) were held Wednesday evening, April 4, 1906, in the Ryman Auditorium, Nashville, Tenn.

An address to the graduates was delivered by Dr. M. C. B. Mason, and the valedictory by T. Ernest McClain.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

John Leroy Berryman	Kentucky	Thomas Ernest McClain, A.B.	Tennessee
Charles Alexander Davis	Tennessee	Hezzie C. Miller	Tennessee
Samuel Lewis Edwards	South Carolina	Dolphus Ferdinand Pughsby	Georgia
Francis Sobers Hunte	British Guiana	J. Mercer G. Ramsey	Virginia
Richard James Johnson, Jr.	Georgia	William Brackett Reed, Jr.	Tennessee
Walter Gail Kalow, Jr.	Louisiana	George Richard Shivery	Georgia
Frederick Paschal Lytes	Arkansas	Joseph Samuel Strickland	Georgia

UNIVERSITY OF PENNSYLVANIA, DEPARTMENT OF DENTISTRY.

The one hundred and fiftieth annual commencement exercises of the University of Pennsylvania were held in the American Academy of Music, Wednesday, June 13, 1906. The oration was delivered by Prof. John B. MacMaster.

The degree of Doctor of Dental Surgery was conferred by the provost, Chas. C. Harrison, LL.D., on the following graduates:

Harold Burton Adams	New York
Albert Earle Ainey	Pennsylvania
Thomas Gustin Aller, Jr.	New York
Floyd Leech Barone	New York
Walter Francis Leo Barry	New Jersey
August Charles Bechtold	New York
Georges Emile Themistocle Beltrami	France
James Franklin Bendernagel, Jr	New York
Elmer Bertelson	Minnesota
Israel Borkin	Russia
Clotaire Marie Boudy	France
Robert Charles Bowers	Florida
Arthur Foster Brigham	Massachusetts
John Joseph Brosnan	Connecticut
Michael Richard Burke	New York
John Albert Cann	Delaware
Georges Cauhépe	France
Joseph White Chandler	New Jersey
Edward Hungerford Chapman	Australia
Wm. H. Trueman Collins	Pennsylvania
Grover Elmer Dailey	New York
Edward Bury Dewhurst	Australia
Chauncey Ely Dressor	Pennsylvania
Micaël Arsène Duz	France
Henry Osborne Edwards	France
Robert Henry Farnham	Rhode Island
Bernard Feldman	New Jersey
Harold Clarence Feldman	New York
Edward Fred'k Forestner	Ohio
John Richard Francis, Jr.	District of Columbia
William Joseph Fuchs	New York
Edward Fred'k Forestner	New Jersey
Jean Germain Goyheneix	France
Thomas Errington Gibbs	England
Edward Lawrence Gibson	Pennsylvania
Stuart Birch Gleason	New Jersey
Wm. Bradford Greenberg	Connecticut
Leon James Greenspan	Russia
Arnold Tyroler Goldwater	New York
Guy Haskins	New Zealand
Douglas Ottinger Henson	Pennsylvania
Arthur Florian Hettig	New York
Herbert Cragg Highton	England
Dana Allen Holden	Vermont
Mervyn Arthur Holland	Australia
Victor Stanley Houchin	England
David Pickens Houston	Tennessee
Dawson Heather Huber	Pennsylvania
Herbert Henning James	England
Sterling Herbert Jenkins	South Carolina
Khalil Moosa Jereissâti	Syria
Edward Kennedy	Pennsylvania
John Kitchenman	Pennsylvania
Emanuel Zebastian Kreidel	Washington
Joseph Jacob Krimmel	Pennsylvania
Arley Caryl Lewis	New York
William Bell Ley	New Jersey
Solomon Hirsh Lipschutz	Pennsylvania
Walter Van Ben Schoten McAuliff	New York
Nicholas Joseph McKone	Connecticut
James Raymond Mallon	Pennsylvania
William George Martens	New York
Angier Clarence Merriman	Maine
Silvio Attilio Mussatti	Italy
Melville David Nesbit	Pennsylvania
George Hiram Nettleton	Connecticut
George Gregg O'Connor	New York
Tsurukichi Okumura	Japan
Marezo Ozaki	Japan
Merle Elmer Painter	Pennsylvania
Albert Palitz	New York
Edward Hadduck Peplow	New Jersey
Max Price	Russia
George Winfield Pulver	New York
Fred Ratzburg	Louisiana
Harry Clifford Ray	New Hampshire
Harold Edwin Roberts	Pennsylvania
Pierre Jean Rousset	France
Adolph Salgo	Austro-Hungary
Henry Lee Salsbury	Connecticut
William Edmund Sammis	New York
Frederick Franklin Schiener, Jr	New Jersey
William Bolster Schuetz	New Jersey
William Harold Sharpless	Pennsylvania
Thomas Francis Sherlock	New York
Selah Gulick Silvers	New Jersey
Edsall Ferrier Simpson	Pennsylvania
Eugene Alonzo Smith	Maryland
Joseph Lees Smith	Pennsylvania
Daniel Welsh Spangenberg	New Jersey
Stanley Williams Spicer	Canada
Clarence Sebactian Steigerwald	Pennsylvania
Raymond Sperry Stevens	New Jersey
William Douglas Stevenson	Washington
Alberic van Stratum	Belgium
Henry Joseph Thielman	Minnesota
Jesse Harold Thomas	Pennsylvania
Arthur Chester Toerner	New York
Ward Milton Van Ness	Connecticut
Louis Viau	France
Georges Leon Villain	France
Milton Jacob Waas	New Jersey
Joseph Harris Wagner	New Jersey
Edward Bazin Warren	New York
Garfield Wilson Weede	Kansas
Bernard Wesbecher	Connecticut
Michael Wilson	New York
Rudolf Winterheim	Germany
William Hollon Wood	Massachusetts
Hermann Guilike Wotherspoon	New York
Ralph Greatrex Yates	England

PHILADELPHIA DENTAL COLLEGE.

The forty-third annual commencement exercises of the Philadelphia Dental College were held in the Lyric Theatre, Philadelphia, Pa., Thursday afternoon, May 31, 1906.

An address to the graduates was delivered by S. H. Guilford, A.M., D.D.S., Ph.D., and the valedictory address was given by Harry Wild, D.D.S.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Willis A. Alexander	Pennsylvania
Walter Emory Alvord	New Jersey
Ernest A. Anderson	Maine
Lewis Victor Bartlett	Canada
Sidney Stauffer Borneman	Pennsylvania
Arthur A Boyle	Connecticut
Olin Bradford	New Jersey
Alexander Neil Brodie	Australia
Arthur Stanley Cambage	Australia
Edward Charles Cole	Rhode Island
Peter Camblos Cosier	New Jersey
Harry Lee Davis	Pennsylvania
Wallace Guss Derr	Pennsylvania
John William Dorland	Canada
William Dexter Dow	Connecticut
Samuel Finkelstein, Jr	New York
Arthur J. Firth	New York
Theodore D. Fonarton	New York
Nelson Robert Ford	Canada
Otto Greenblatt	Pennsylvania
Alfred M. Haas	Pennsylvania
John James Hargrave	New York
Clinton R. Haskell	Oregon
Elmer Nathaniel Jacobson	Pennsylvania
Pearson Franklin Johnson	Canada
Louis Alexander Lancit	New York
William Bowie Lutton	New Jersey
George Patman McFadden	Pennsylvania
Archibald H. McKibben	Kentucky
Philip Joseph McLaughlin	Connecticut
Edward Clyde Miller	Pennsylvania
Wiley Edward Myers	Pennsylvania
Albert Raymond Paul	Australia
Stanislaus Michael Rowen	Rhode Island
Edward James Sammons	Massachusetts
Ray J. Schropp	Pennsylvania
James Thomas Sheehan	Massachusetts
Samuel Slavin	Pennsylvania
Clyde Corwin Snyder	Pennsylvania
Charles Louis Svenson	Sweden
Lewis Tetlow, Jr	Connecticut
Alfred James Thomas	British Columbia
James Michael Tobin	Pennsylvania
Aubrey Wilton Tower	Maine
William Bond Van Riper	New Jersey
Paul Martin Wenzel	Pennsylvania
Harry Wild	New Jersey
William C. Wilson	Pennsylvania

UNIVERSITY COLLEGE OF MEDICINE, DEPARTMENT OF DENTISTRY.

The annual commencement exercises of the Dental Department, University College of Medicine, were held at the New Academy of Music, Richmond, Va., Thursday evening, May 17, 1906.

Addresses were delivered by the president, Stuart McGuire, M.D., and Hon. H. St. George Tucker, A.M.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Joseph H. Austin	North Carolina
Thomas M. Hawkins	North Carolina
Leslie Vanwirt Henderson	Virginia
Elbert Stewart Honaker	Virginia
Joseph Claiborne Johnson	Virginia
James Benjamin Lester	Virginia
J. Lloyd Mears, Jr	Virginia
Harvey V. Price	North Carolina

STATE DENTAL COLLEGE, TEXAS.

The first annual commencement exercises of the State Dental College were held at Carnegie Hall, Dallas, Texas, Friday evening, May 4, 1906.

The doctorate address was delivered by Hon. E. B. Muse.

The degree of Doctor of Dental Surgery was conferred by the dean, D. E. Morrow, D.D.S., on the following graduates:

C. C. Baker   T. G. Bradford   Horace Overbey   George R. Smith   K. F. Tanuichi

BARNES UNIVERSITY, DENTAL DEPARTMENT.

The annual commencement exercises of the Dental Department of the Barnes University were held in St. Louis, Mo., Wednesday, May 9, 1906.

The valedictory was delivered by Prof. James E. Ament, Ph.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Harry Maurice Collie	Kentucky
James Conley Gault	Oklahoma
Mack Goode	Missouri
James Blaine Leekinzy	Missouri
Patrick Henry Phelan	Missouri
Thomas W. Ross	Missouri

INDIANA DENTAL COLLEGE.

The twenty-seventh annual commencement exercises of the Indiana Dental College (University of Indianapolis, Department of Dental Surgery), were held Monday evening, May 7, 1906, at Caleb Mills Hall, Indianapolis, Ind.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

W. C. Ballou
Will Barnfield
W. L. Clark
C. O. Clemmer
H. D. Cofield
Chester Ferguson
A. T. Funkhouser
Jacob Goldman
F. L. Gravis
Chas. Green
H. A. Kelsey
H. B. Ketcham
J. D. Kirkpatrick
Harry Lamb
John Lavengood
J. H. McClain
H. W. Marxmiller
Agnes Miller
Howard Raper
Alex. Ross
Chas. Taggart
C. W. Witter

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The fiftieth annual commencement exercises of the Pennsylvania College of Dental Surgery were held in the Academy of Music, Friday evening, June 1, 1906.

An address to the graduates was delivered by Prof. Wilbur F. Litch, M.D., D.D.S.

The degree of Doctor of Dental Surgery was conferred by I. Minis Hays, M.D., president of the college, on the following graduates:

Leonard Walton Abbott	Delaware
Levi Edward Ace	Pennsylvania
Roy Walter Alward	Canada
Arthur Edward Anderson	New York
Barnet Bakerman	New York
Mary Elizabeth Barker	Connecticut
Alfred J. Birks	South Australia
Frank Birtwistle	Rhode Island
Frank Francis Bishop	St. Kitts, B.W.I.
John Walter Bliss	Connecticut
Augustus T. Capps	Pennsylvania
Chas. Alexander Church	Pennsylvania
Agnes Degen Cloud	New York
William Henry Trueman Collins	Pennsylvania
Solomon David	New York
Frank Broughton Davis	New Hampshire
Edward R. Doughty	New Jersey
Samuel A. Druckerman	New York
Joseph Elin	New Jersey
Mayer Sam Ginsburg	New York
G. A. Gonzalez Lamarche	St. Domingo
Ellsworth Henry Good	Pennsylvania
Grace Twemlow Hammond	New York
Henry L. Jones	Pennsylvania
Joseph N. Katz	Pennsylvania
Roy James Kintz	Pennsylvania
Joseph Kramer	New York
Norman Lassiter	North Carolina
Benjamin J. Lipschitz	New York
David J. McBride	Pennsylvania
Elnora Romaine McNulty	New York
Curtis Naum Marsh	Pennsylvania
John William Menzie	Canada
Kentaro Morihira, M.D.	Japan
J. Bird Moyer, B.S., Ph.D.	Pennsylvania
William Westfall Moyer	Pennsylvania
Max Moskowitz	Germany
Eduardo O'Bourke y Cabrera	Cuba
Charles C. Patten	Pennsylvania
LeRoy Pickersgill	Pennsylvania
Stanley Stewart Reynolds	New York
Perfecto Rodriguez y Mora	Cuba
George Simpson Ryder	Pennsylvania
George Shapiro	New York
Henry S. Shapiro	Pennsylvania
Max Simowitch	New York
Samuel G. Smith	Massachusetts
David J. Soltman	Pennsylvania
Harry J. Stambler	Pennsylvania
Vernon Lee Dey Stultz	New Jersey
Charles Arthur Tattersley	Pennsylvania
Morris Tepper	New York
James Preston Trowbridge	South Carolina
Clarence Parke Waugaman	Pennsylvania

UNIVERSITY OF TENNESSEE, DEPARTMENT OF DENTISTRY.

The annual commencement exercises of the Dental Department of the University of Tennessee were held Tuesday, May 1, 1906, in Watkins' Hall, Nashville, Tenn.

Addresses were delivered by Prof. Perry Bromberg, and the Rt. Rev. Thos. F. Gailor, D.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

R. H. Black	Mississippi
I. Blume	Louisiana
William Paxton Fly	Tennessee
Walter S. George	Arkansas
E. G. Huston	Texas
A. C. Jackman	Kentucky
D. A. McCall	Texas
Willard F. Powers	Mississippi

UNIVERSITY OF CALIFORNIA, COLLEGE OF DENTISTRY.

The annual commencement exercises of the University of California, College of Dentistry, were held in the Greek Theater, Berkeley, Cal., May 16, 1906.

The degree of Doctor of Dental Surgery was conferred by the president, Benjamin Ide Wheeler, Ph.D., LL.D., on the following graduates:

Matilda Boesch
Francis Joseph Colligan
Zachary Taylor Coney
William Arthur Cree
George Nathaniel Fisher
John Blaine Fox
Mary Elizabeth Fratus
Charles Dearborn Goodman
John Joseph Griffin
Selmar Walter Isaacson
Benjamin Cory Ledyard
Leo Maynard Linscott
Peter Davidson Mac Sween
William MacPherson Mason
J. Oxley Moore
Norman Summer Peck
Ernest Cline Shumard
Sidney Alexander Smith
Charles Leon Stewart
Charles Henry Strub
LeRoy Touson
Samuel Paul Truitt
Percy Atherton Webber
Russell Cleveland West

UNIVERSITY OF SOUTHERN CALIFORNIA, COLLEGE OF DENTISTRY.

The ninth annual commencement exercises of the College of Dentistry, University of Southern California, were held Thursday, May 31, 1906, in Simpson's Auditorium, Los Angeles, Cal.

Addresses were delivered by Rev. Baker P. Lee, Dr. J. D. Moody, and by the president, George F. Bovard, A.M., D.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Herbert Chas. Bailie
Henry Frederick Boeckman
John Hiram Boege
Anson Ralph Brown
Leo Wentworth Burdette
Stacy Wendell Clapp
Garrett James Crandall
John Howell Darby
William Manna Foster
Edgar Eugene Goff
Clyde Lafayette Holcomb
John Copel Hopkins
Robert Braxton Houston
James Amos Justice
John George Kanouse, Jr.
Campbell Farris Kincaid
Richard Carlson Lane
Richard Crooks Lockwood
Charles Olney McBean
William Henry McBean
James David McCoy
Frederick Stephen McDonald
Thomas Wheeler McKenzie
Lawrence Eberhard Nichols
James Albert Oates
Vincent Adebert Rossiter
Alden John West

COLLEGE OF DENTAL AND ORAL SURGERY OF NEW YORK.

The annual commencement exercises of the College of Dental and Oral Surgery of New York were held Monday, May 28, 1906, in Mendelssohn Hall, New York city.

An address to the graduates was delivered by Rev. Fred Clair Baldwin, D.D.

The degree of Doctor of Dental Surgery was conferred by Mr. Clarkson Cowl, president of the board of trustees, on the following graduates:

August Frederick Bauer	New York
Samuel Berkman	New York
Jacob Bollinger, Jr	New York
Benjamin Boyarsky	Russia
Meyer Breslow	New York
Everett Henry Brower	New York
James Edward Cabanis	Virginia
Georgette Jeanns Cantaluppi	New York
Edna May Condi	New York
John Herman Cordes	New York
Philip Feust	New York
Samuel Nathan Gratz	New York
Joseph John Guilshan, M.D.	New York
Herbert Haigh	New York
Max Heimlich	Hungary
Leivik Hermann, D.D.S.	Russia
Philip Lewin	New York
Bernard Lissey	New York
Julius Lunenfeld	Austria
Edmund Mandell	New York
Edmund Henry Mayer	New York
Joseph Henry Mayer	New York
Isaac Miller	Russia
Ralph Prescott Morse	Massachusetts
Manuel Orsay, D.D.S.	South America
Moses Plitt	New York
Julius Buschkin	New York
Pauline Raywid, D.D.S.	Russia
Samuel Richter	New York
Helen Margaret Roach	New York
Lea Moeseewna Lea, D.D.S.	Russia
Kate Sablow	New York
Frank Whiting Sanger	New Jersey
John Charles Herman Schoenborn, Jr	New York
Frederick John Schwarz	Germany
Annette Singer	Crimea
Rudolph William Specht, Jr.	New York
Aaron Philip Sussman	New York
William Grant Vail	New York
Harry Waldman	New York
Oscar Jacob Worthen	New York

SOUTHERN DENTAL COLLEGE.

The annual commencement exercises of the Southern Dental College were held in the Grand Opera House, Atlanta, Georgia, May 1, 1906.

The valedictory was delivered by John Perry Gunn, D.D.S.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

R. L. Anderson, M.D.
Cornaro D. Baird
Collier M. Black
Robert F. Blackshear
Lee L. Bolton
Reuben Chason
Dempsey D. Crews
Thayer R. Crovat
Alexander F. Daniel
Isaac Dixon
Henry Carroll Farrin
Hugh M. Farrior
Charles H. Gregorie
John Perry Gunn
W. Dodge Hearn
Henry H. Holliman
Chester B. Hutchison
Edwin E. Keith
Ulyses Claude Martin
Joseph L. Mingledorff
T. Knight McLemore
Cicero E. Norris
Hershel D. Owens
James Williams Powell
A. Gordan Quattlebaum
Lawrence W. Rikard
Julius Seamans
Addin H. Smith
James M. Smith
John Manning Temples
James T. Tyner

COLLEGE OF DENTISTRY, UNIVERSITY OF ILLINOIS.

The fifth annual commencement exercises of the College of Dentistry, University of Illinois, were held Thursday, May 31, 1906, in Steinway Hall, Chicago, Ill.

The doctorate address was delivered by E. G. Cooley, LL.D.

The degree of Doctor of Dental Surgery was conferred by Edmund J. James, Ph.D., LL.D., president of the university, on the following graduates:

Mose Frank Bloomenstiel
Elizabeth Neil Brady, M.D.
Benjamin Joseph Bronstein
Floyd Ellis Clinite
Guy Thomas Coleman, M.D.
Charles Garfield Cree
Earl Hartland Danforth
Louis Bernard Desser
John Helmer Dyblie
Herman Henry Ertel
Joseph Clark Frey
Walter William Gill
Otto W. Helmick
Walter Horace Holden
James Abram Jent
Orrin Frederic Landon
Frank Lotreck
Robb Lyle Marquis
Clark Willard Marsh
Clarence Joseph Mason
Hugo Chr. Mauermann
Clarence B. Meek
Louis Miller
John Ole Mortenson
Ralph Rogers Mundell
Theodore Martin Nelson
Joseph Henry Plummer
Gustaf Alwin Preusker
John Albert Rockfellow
William Joseph Rogers
Walter Henry Shaffer
Everett Lee Simmons
Carl George Stocker
Elmer Eugene Taylor
William Thompson
William Bradford Tym
Valerian Julian Vita
Thomas Raymond Walker
Glen Burrows Waterman
Wallace Alexander Wimmer
Chester Allen Worthington
Sam Lester Worthington
James Alexander Wright

KANSAS CITY DENTAL COLLEGE.

The twenty-fifth annual commencement exercises of the Kansas City Dental College were held in the Central High School Auditorium, Wednesday, May 9, 1906.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Isaac Edwin Bailey
Walter George Barr.
Albert Newton Blake
Aylett Treville Britt
William Edgar Buchanan
Wayne Herbert Chapin
Mark Emett Colopy
Christian Glunz
Ernest Hugh Hamilton
Clarence Emanuel Heer
Harkey David Hellums
Ernest Benjamin Hill
Elbert Austin Hunter
James Elliott Lyons
Thomas Brown Magill
Maurice Woodward Mann
Oscar John Neiderwimer
Clarence Archie Ogg
Hayden Walker Osborn
Lora Leslie Pfeiffer
William Joseph Reidy
William Thomas Simpson
Blaine Truesdell

BALTIMORE MEDICAL COLLEGE, DENTAL DEPARTMENT.

The eleventh annual commencement exercises of the Dental Department of Baltimore Medical College were held in Albaugh's Theater, Baltimore, Md., Thursday, May 10, 1906.

An oration was delivered by Rev. DeWitt M. Benham, D. D., and the valedictorian was Daniel C. Griffen.

The degree of Doctor of Dental Surgery was conferred by Prof. S. K. Merrick, president of the board of directors, on the following graduates:

Robert Weller Ball	Connecticut
Frederick Stephen Braley	New York
Charles Anthony Brown	New York
Joseph Charles Devlin	Massachusetts
Clifford Ellsworth Dexter	Nova Scotia
Barnett Lewis Gold	Roumania
Koppel S. Gold	Maryland
Daniel Charles Griffin	Massachusetts
James William McKeon	New Jersey
Archibald John MacLean	New York
Edgar Luke Major	Massachusetts
Leon Clark Patterson	Canada
Arthur Alfred Peront	Massachusetts
Waverley J. Rockey	Pennsylvania
Frank Chrisman St. John	New York
Harry Merriman Stumpf	Maryland
Willis Albert Wilbur	Wisconsin

COLORADO COLLEGE OF DENTAL SURGERY.

The annual commencement exercises of the Colorado College of Dental Surgery, Dental Department of the University of Denver, were held on Thursday evening, May 17, 1906, at the Trinity M. E. Church, Denver, Colo.

An address was delivered by J. E. Le Rossignol, Ph.D.

The degree of Doctor of Dental Surgery was conferred by the chancellor, Henry A. Buchtel, D.D., LL.D., on the following graduates:

Waldo J. Adams
David A. Block
O. A. Burgeson
C. W. Coover
H. H. Field
Frank D. Johnson
A. O. Knight
A. A. Lloyd
Ralph N. Pullen
J. L. Smith
J. H. Waddell
R. P. Walton
H. B. Zendel

CHICAGO COLLEGE OF DENTAL SURGERY.

The twenty-fourth annual commencement exercises of the Chicago College of Dental Surgery were held Tuesday, May 29, 1906, at the Garrick Theatre, Chicago, Ill.

The doctorate address was delivered by George E. Vincent, Ph.D.

The degree of Doctor of Dental Surgery was conferred by the president, Truman W. Brophy, M.D., D.D.S., LL.D., on the following graduates:

William Edgar Aaron
James Selby Alexander
Charles Ewing Allen
Henry Wilson Allen
Jewell Abrim Alrick
James Lester Ambrose
Roy Ellsworth Barber
Elmer Samuel Best
George Elliott Bolsinger
George Clorisse Boudreau
Henry Weston Burgess
Walter Bernard Cary
Thomas Joseph Cassidy
Haze Richard Clark
Samuel Jackson Clark
Edgar David Coolidge
James Weldon Coram
Leo Patrick Cummings
Albert Edward DeRiemer
Stephen Garfield Dolby
Ralph Orr Dugland
John Robert Duncan
Gertis Dresser Elmer
Arthur Garfield Emerson
Ward Vernon Fallis
William Thomas Fitzgerald
Alfred Perry George
Sylvester Milton Gibbs
Theodore Ludwig Gilbertson
Glen Eugene Godfrey
Thomas Arthur Goodridge
John Edward Hajicek
Robert Stewart Hall
Thomas Chris Hansen
Elmer Charles Hanson
Joel Barksdale Hardison
William E. Hocking
Shigeo Ibuka
Adolph George W. Jensen
Henry Charles Kaschan
Paul Oscar Keenan
Earl B. Knight
John Thomas Knox
Fred Charles Lange
Joshua Barnes Lape
George William Lausted
Wm. Bainbridge Le Argent
Richard Dodd Le Febre
Wilbur Hugh McKelvey
Lewis Milton Mahood
Clyde Dee Midkiff
Arthur Robert Miner
James Claussen Mortonson
Jan Hendrik Muntendan
William Ralph Parr
William Warrington Peebles
Charles William Peterson
Lewis Arthur Platts, Jr.
Evald Henning Raedel
Harold D. Rosenberg
Clarence Eugene Schmidt
Junius Seegmiller
Charles Herbert Selleck
Joseph Malcolm Sinclair
Ernest Gage Skiff
Wilfred Mitchell Stoner
Morton Ralph Stover
David Lawrence Sullivan
Wesley William Taggett
William Eugene Thomas
George Raymond Treiber
Rudolph Robert Vasumpaur
Martin Myron Voorhees
Lewis Tobias Weinshenker
Jacob Leopold Wildberg
Howard Irving Williams
Ralph Ellis Wilson
Edward Mason Woolley

NEW ORLEANS COLLEGE OF DENTISTRY.

The annual commencement exercises of the New Orleans College of Dentistry were held Thursday, May 31, 1906, at the Tulane Theater, New Orleans, La.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Jefferson D. Barbre
Charles Scott Brown
Oscar J. Burnham
Luther R. Bush
Eldredge Clement
S. Gabon Ellis
Augustine A. Garrison
Joe Gillespie
Elof T. Hedlund
George Indest
L. Elie Landry
Ashbel D. Melanson
Frank H. Morey
Edward O. Munson
Alphonse Peyroux, Jr.
H. Clay Phillips
Andrew Prejean
Emile H. Ramelli
Rinaldo J. Salatich
Paul Schaeffer
Anthony H. Victor
Rudolf C. Vignes
William C. Wood
Clarence C. Wood

OHIO MEDICAL UNIVERSITY, DENTAL DEPARTMENT.

The fourteenth annual commencement exercises of the Dental Department of the Ohio Medical University were held in Memorial Hall Auditorium, Columbus, Ohio, Tuesday evening, May 8, 1906.

Addresses were delivered by J. Knox Montgomery, D.D., and William McPherson, Ph.D.

The degree of Doctor of Dental Surgery was conferred by William Rane Lazenby, secretary of the board of trustees, on the following graduates:

Irwin Alexander Bottenhorn	Pennsylvania
Clarence Wilbur Coffman	Ohio
Alvin Olen Cole	Ohio
Pliny McConnell Crume	Ohio
William Wesley Curtiss	Massachusetts
Charles Clark Eckfield	Ohio
Clarence Rodney Eshelman	Ohio
Henry James Friedman	Ohio
William Dericson Hand	Ohio
Joseph Sylvester McDonald	Ohio
John William Means	Ohio
Arthur Silas Oilkinton	Michigan
Marvin Powell	Indiana
La Verne Riemenschneider	Michigan
William Roche	Massachusetts
Leroy Parsons Schaffer	Ohio
Tobias Alfred Smith	Kentucky
Thomas Edgar Sonnanstine	Ohio
Walter Arlington Whitacre	Ohio
Howard Retig Wolf	Ohio
Parl Richard Wineland	Ohio

ST. LOUIS DENTAL COLLEGE.

The annual commencement exercises of the St. Louis Dental College were held Friday, May 11, 1906, in the Y. M. C. A. Hall.

An address was delivered to the graduates by Rev. H. S. Bradley.

The degree of Doctor of Dental Surgery was conferred by the dean, M. C. Marshall, D.D.S., on the following graduates:

Lytle Schooler Adams	Kentucky
Oliver William Appel	Missouri
Henry Charles Biehler	Missouri
Alva Wilson Critz	Missouri
Arthur Monroe Furnish	Missouri
Charles Henry Goodnight	Texas
Archibald Rex Hancock	Missouri
Fred Hampton Henry	Illinois
Henry Monroe Hill	Illinois
Pearl Seaburn Hollenshead	Kansas
Edward Daniel Hubbard	Illinois
Edwin Albert Kitchell	Missouri
Virgil Loeb	Missouri
Weber Walter Minges	Missouri
Elmer Elijah Myers	Missouri
William Lovell O'Neill	Kansas
Edwin Booth Partenheimer	Missouri
George Sehorn Phillips	Washington
Theophilus Robb	Missouri
Herman Hugo Schindler	Missouri
Timothy James Slattery	Missouri
Benjamin Ernest Clyde Slawson	Missouri
Bertha Isabel Smith	Missouri
Phil Stout Struble	Missouri
Willis Napoleon Sullivan	Illinois
Maurice Winfred Taylor	Missouri
Harry Lee Washington	Missouri
McNutt Welch	Missouri
Willis Nelson Winder	Kansas

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

July, August, and September, 1906.

JULY.

Maine Dental Society. Moosehead Lake. Three days: July 17th to 19th.

Michigan State Dental Association. Detroit. Three days: July 9th to 11th.

New Jersey State Dental Society. Asbury Park. Four days: July 18th to 21st.

Wisconsin State Dental Society. Madison. Three days: July 17th to 19th.

AUGUST.

American Dental Society of Europe. Berlin, Ger. Four days: August 1st to 4th.

Central-Verein Deutscher Zahnärzte. Dresden, Saxony. Three days: August 4th to 6th.

International Dental Federation. Geneva, Switzerland. Two days: August 8th and 9th.

SEPTEMBER.

Canadian Dental Association. Montreal. Four days: September 5th to 8th.

Interstate Dental Fraternity. Atlanta. September 17th.

National Association of Dental Examiners. Atlanta. Four days: September 14th to 17th.

National Association of Dental Faculties. Atlanta. September 14th.

National Dental Association. Atlanta. September 18th.

Examiners' Meetings.

Arizona Board of Examiners. Tucson. July 2d to 4th.

District of Columbia Board of Examiners. Washington, D. C. July 5th to 7th.

Montana Board of Examiners. Helena. July 16th to 18th.

New Jersey Board of Registration. Trenton. July 9th to 13th.

Rhode Island Board of Registration. Providence. July 10th to 12th.

South Dakota Board of Examiners. Sioux Falls. July 31st to August 2d.

Vermont Board of Dental Examiners. Montpelier. July 10th to 12th.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

General Meeting to be held in Geneva, August 8 and 9, 1906.

THE next annual meeting of the Fédération Dentaire Internationale will be held in Geneva, Switzerland, August 8 and 9, 1906. By direction of Dr. W. D. Miller, its president, and upon the authority of the Executive Council, the meeting will be a general one, at which all members of the F. D. I. and those eligible for membership who may be interested in the work and purposes of the Federation are invited to be present.

The Geneva meeting promises to be the most important reunion which has been held, and its results will exert a far-reaching influence upon the progress of dentistry for the coming year at least. The social side of the meeting is already an assured success. The attractions of Switzerland are too well known to need favorable comment. Our colleagues of the little sister republic are exerting every effort to create a new standard of hospitality in the entertainment of F. D. I. delegates, so that as a combination of vacation recreation and professional social intercourse, with the opportunity to take part in a most important movement for the uplifting of our profession both in an international and national way, the Geneva meeting affords a rare opportunity. Let everyone who can do so contribute by his presence to the success of this great meeting.

Provisional Program.

OPENING SESSION.

(1) President's address.

(2) Report of the secretary-general.

(3) Report of the treasurer and appointment of auditors.

(4) Election of members of the *International Commission on Nomenclature.* (Chairman, Dr. John Grevers, Amsterdam.)

(5) Election of members of the *International Commission on Jurisprudence and Professional Ethics.*

(6) Motion by a member to hold biennial or triennial meetings only.

(7) Discussion as to what shall be the plan of work of the F. D. I. in the immediate future.

MEETINGS OF COMMISSIONS.

1. *Commission of Education.* (Chairman, Dr. Truman W. Brophy, Chicago.)

  (1) Motion by the French National Committee: Adoption of a definite plan of work for the commission, and study of the best means to be employed in order to bring about the establishment of regular relations between reputable dental colleges of different countries.

  (2) Motion by Dr. Arkövy: Dentistry (stomatology) is a branch of general medicine and belongs to the structure of medical science and medical education.

  (3) Motion by Angelo Chiavaro, Rome: Physicians intending to pursue dental courses at dental schools must pledge themselves to continue such studies long enough to acquire a sufficient degree of skill and knowledge of the practical branches of dentistry to enable them to practice dentistry in a manner creditable to the profession.

II. *Commission of Hygiene and Public Dental Service.* (Chairman, Dr. L. C. Bryan, Basle, Switzerland.)

  (1) Discussion on the advisability of publishing a booklet on dental hygiene.

  (2) Motion by Dr. Bryan: (a) How are we to reach, interest, and educate the public in dental hygiene? (b) How shall the school children be treated to assure the development of a useful dentition through life? (c) How shall the needy public be treated?

III. *Commission on Military and Naval Dental Service.* (Chairman, Dr. Williams Donnally, Washington, D. C.)

IV. *International Commission on the Dental Press.* (Chairman, Dr. A. W. Harlan, New York.)

  Study of the means to be employed to bring about the creation of an international dental organ, and to establish closer relations between the professional journals of different countries.

V. *Commission on Jurisprudence and Professional Ethics.* (Chairman, Dr. Wm. Carr, New York.)

VI. *Commission on History of Dentistry.* (Chairman, Dr. Charles McManus, Hartford, Conn.)

VII. *Commission on Dental Nomenclature.* (Chairman, Dr. John Grevers, Amsterdam.)

VIII. *Commission on the definition of What Shall Constitute a National Committee.* Drs. Harlan, Wm. Guye, and E. Sauvez.

IX. *Commission on the Means to be Employed to Furnish the Poorer Classes with a Cheap Tooth-brush.* (Chairman, Dr. Haderup, Copenhagen.)

CLOSING SESSION.

(1) Report of auditors and consideration of treasurer's report.

(2) Reports of the various commissions and vote of resolutions.

(3) Designation of date and place of next meeting.

(4) Individual motions.

EDWARD C. KIRK, *Secretary-general.*

NATIONAL DENTAL ASSOCIATION.

TENTH ANNUAL SESSION.

THE tenth annual session of the National Dental Association will be held in Atlanta, Ga., commencing Tuesday, September 18, 1906.

The New Kimball House has been selected by the local committee of arrangements as headquarters, where all general sessions of the association and of the sections will be held. The rates per day at the New Kimball House will be—European plan, from $1.50 to $4.00; American plan, from $3.00 to $6.00, governed by choice of rooms.

The usual railroad rate of one and one-third fare for the round trip, certificate plan, will be arranged for, and definite dates and particulars given later by Dr. J. D. Patterson, chairman of the Executive Committee.

The general officers and those of the sections, as well as the committee chairmen and their members, have been working hard to provide an interesting and instructive program, and a large attendance is expected.

In one of the general sessions, Chas. McManus, Hartford, Conn., chairman Committee on History, will present an illustrated paper on "The Remarkable History of the Profession and the Splendid Character of the Men of the Past Who Helped to Build It Up," and A. W. Harlan, New York city, will present a paper on "The Blue Light and Heat as Therapeutic Agents."

Section I.

This section presents the following program of papers for consideration: "The Present Status of Porcelain Inlays," John Quincy Byram, Indianapolis, Ind.; "Orthodontia," Richard Summa, St. Louis, Mo.; "A Phase of Art in Prosthesis," George H. Wilson, Cleveland, Ohio; "Porcelain," C. N. Thompson, Chicago, Ill.; "Setting Crowns and Bridges with Gutta-Percha," L. G. Noel, Nashville, Tenn.; "Orthodontia," Victor H. Jackson, New York city; "Orthodontia," Calvin S. Case, Chicago, Ill.; "The Inevitable Outcome of Crown and Bridge Work," E. Parmly Brown, New York city; "General Practice," W. Leon Ellerbeck, Salt Lake City, Utah.

B. L. THORPE, *Ch'm.*, St. Louis,
D. O. M. LE CRON, *Sec'y*,
St. Louis, Mo.

Section II.

This section presents the following program of papers for consideration: "Manual Training an Essential to Dental Education," Burton Lee Thorpe, St. Louis, Mo. Subjects not given: George S. Vann, Gadsden, Ala., and Clarence J. Grieves, Baltimore, Md. "Prosthetic Nomenclature." Geo. H. Wilson, Cleveland, Ohio; "The Nomenclature of Materia Medica and Therapeutics," A. H. Peck, Chicago, Ill.; "Operative Dentistry," H. H. Johnson, Macon, Ga.

HOWARD E. ROBERTS, *Ch'm.*, Phila., Pa.
C. S. BUTLER, *Sec'y*, Buffalo, N. Y.

Section III.

This section presents the following program of papers for consideration: (Subject to be announced), W. J. Roe, Philadelphia, Pa.; "Treatment of Pyorrhea Alveolaris with Stereopticon Illustrations of Cases Before and After Treatment," Gordon White, Nashville, Tenn.; Chairman's Address, "Review of Progress for the Year in Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects," by the chairman, the vice-chairman, and the secretary.

Geo. V. I. Brown, *Ch'm*,
Milwaukee, Wis.
W. E. Grant, *Vice-Ch'm*,
Louisville, Ky.
W. H. G. Logan, *Sec'y*,
Chicago, Ill.

Committee on Oral Hygiene.

The Committee on Oral Hygiene promise an interesting summary of their work, illustrated methods of teaching the science to both dentists and laymen, essays, resolutions, and the report of the committee.

J. P. Corley, *Ch'm*, Greensboro, Ala.
F. W. Stiff, *Sec'y*, Richmond, Va.

Clinics.

We are promised a large and interesting list of clinics, which will be held in one of the local dental college buildings.

The Atlanta Dental College, which is just two blocks from the Kimball House, has been selected as the place for holding the clinics, a full list of which will appear in the August and September journals.

Thomas P. Hinman, *Ch'm*, Atlanta, Ga.
C. L. Alexander, *Sec'y*, Charlotte, N. C.

An N. D. A. Dental Journal.

It is earnestly desired that there shall be a large attendance of members and delegates, so that the committee appointed to devise ways and means to own and control a dental journal may feel encouraged to launch such a scheme as will at once meet the approval and hearty support of the association, which now has members enough to guarantee the project.

Many other features for a new era of success in the National Dental Association can be mapped out at the Atlanta meeting, if only we have a sufficiently large and enthusiastic gathering of the members of the profession to make it appear worth while.

Dr. S. W. Foster, Atlanta, Ga., has accepted the chairmanship of the Local Committee of Arrangements, in succession to the late Dr. J. A. Chapple.

M. F. Finley, *President*,
Washington, D. C.

CENTRAL-VEREIN DEUTSCHER ZAHNÄRZTE.

The next annual meeting of the Central-Verein Deutscher Zahnärzte will be held at Dresden (Saxony) August 4 to 6, 1906, immediately following the meeting of the American Dental Society of Europe in Berlin, and preceding that of the Fédération Dentaire Internationale, which takes place at Geneva on the 8th and 9th of August. Members of the profession in America who took part in the meeting of the C. V. D. Z. at Hanover know that they will be sure of a hearty welcome, and I hereby cordially invite as many of them as intend visiting Europe during the coming summer to arrange their plans so as to meet with us in Dresden at the above-mentioned date.

W. D. Miller, *President.*

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The annual meeting of the National Association of Dental Faculties will be held in Atlanta, Ga., commencing at 2 P.M., Friday, September 14, 1906. The executive committee will meet at 10 A.M. on the same day.

H. B. Tileston, *Ch'man Ex. Committee*,
R. M. Sanger, *Sec'y Ex. Committee*,
East Orange, N. J.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The twenty-fourth annual meeting of the National Association of Dental Examiners will be held at the New Kimball House, Atlanta, Ga., September 14th to 17th, commencing 10 A.M., Friday, September 14, 1906.

The rates per day will be, European plan, from $1.50 to $4.00, American plan, from $3.00 to $6.00, governed by choice of rooms.

The convention hall is in the hotel, and every effort will be made by the proprietors for the care and comfort of the members.

Arrangements are being perfected for those desiring a short ocean trip at reduced rates, via the Clyde and Old Dominion steamship lines, notice of which will be given by circular later.

Chas. A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

COMMITTEE ON DENTAL HISTORY, N. D. A.

At the Buffalo meeting of the National Dental Association, the Committee on History of Dentistry reported to the association that Dr. Vincenzo Guerini of Naples, Italy, had written a History of Dentistry from the earliest times down to the beginning of the nineteenth century, which work is in the hands of the committee, having been translated into English and fully revised and edited. Dr. Guerini has generously placed the publication of this great work under the patronage of the National Dental Association in token of his appreciation of American dental development. In order that the work may be published without financial loss it is necessary that about 700 subscriptions for copies at $5.00 each be obtained before contracts for printing, binding, and publishing the work can be entered into, and the duty of securing these advance subscriptions has been assigned to the Committee on History of Dentistry of the National Dental Association.

The committee believes that the general and growing interest in the history of our profession is a sufficient warrant for this undertaking. Our historical records are scattered through a vast literature and much of it is of great antiquity. These data have never before been gathered together and arranged in a consequential logical order. Dr. Guerini has spent many years of his professional life and large amounts of money in collecting the material for this work. It has involved the searching of libraries and museums, the translation of many old documents and publications, and the digesting and arranging of this matter into proper form. As an historical writer the distinguished author needs no introduction, as his contributions on dental history in our magazines are well known, and their excellence is an earnest of the excellent and exhaustive character of his larger work now in the hands of the Committee on History of Dentistry for publication.

The importance and value of dental art and science as a humane service is well recognized, but we are so accustomed to view this question from the modern standpoint that we, generally speaking, overlook the immense work done by our predecessors, reaching far back in unbroken line to the mists of antiquity. It was they who laid the foundations upon which modern dentistry has been built, and no man can peruse the record of their efforts as set forth in Dr. Guerini's book without developing a higher appreciation of their work and a keener realization of the worth and dignity of the calling which they in common with ourselves followed.

It is the desire of the committee having this matter in charge to secure as promptly as possible the subscriptions necessary before the work can be published. We ask you to consider this as a personal appeal to forward your subscription for the work to Dr. Charles S. Butler, The Frontenac, Buffalo, N. Y., who, with the treasurer of the National Dental Association, Dr. V. E. Turner, Raleigh, N. C., will act as custodian of the publication fund.

Announcement will be from time to time made in the dental journals of the growth of the subscription list and the progress of the work of publication. The sooner the required 700 names are obtained, the sooner the work can be issued. The volume, it is estimated, will comprise about 500 pages. It will be profusely illustrated, and bound in cloth.

In case this proposed publication meets with the success which it merits, a second and companion volume, treating of the more modern aspect of dentistry, will probably be issued under the same auspices and conditions.

Edward C. Kirk, Philadelphia.
Wm. H. Trueman, Philadelphia.
Gordon White, Nashville, Tenn.
H. L. Ambler, Cleveland, Ohio.
Jas. McManus, Hartford, Conn.
J. Y. Crawford, Nashville, Tenn.
A. H. Fuller, St. Louis, Mo.
S. A. Freeman, Buffalo, N. Y.
W. E. Boardman, Boston, Mass.
Charles S. Butler, Buffalo, N. Y.

Burton Lee Thorpe, *Sec'y*, St. Louis, Mo.
Chas. McManus, *Chairman*, Hartford, Conn.

AMERICAN SOCIETY OF ORTHODONTISTS.

The next meeting of the American Society of Orthodontists will be held in New York city during Christmas week, 1906.

Frederick S. McKay, *Sec'y*,
St. Louis, Mo.

INTERSTATE DENTAL FRATERNITY.

The annual meeting of the Interstate Dental Fraternity will be held at the New Kimball House, Atlanta, Ga., on Monday, September 17, 1906.

The meeting and banquet will be in charge of Dr. Thos. P. Hinman, the vice-president for Georgia. Dr. Hinman's well-established reputation as a host is a sufficient guarantee for a royal good time for all the fraternity who can arrange to be there. Do not miss it.

R. M. Sanger, *Nat'l Sec'y.*

AMERICAN DENTAL SOCIETY OF EUROPE.

The next meeting of the American Dental Society of Europe will be held at Berlin, Germany, August 1, 2, 3, and 4, 1906. A most cordial invitation is extended to members of the profession to be present.

An interesting program is already assured, and it is hoped to make this one of the most interesting and largely attended meetings in the history of the society.

Geo. O. Webster. *Hon. Sec'y,*
Pariser Platz I, Berlin, Germany.

NEW JERSEY STATE DENTAL SOCIETY.

The New Jersey State Dental Society will hold its thirty-sixth annual meeting in the Auditorium, Asbury Park, N. J., commencing Wednesday, July 18th and continuing until Saturday, July 21st. New demonstrations, clinics, and instructive papers will be the great feature of this meeting.

Accommodations can be secured with the Hotel Columbia at a rate of $3.00 per day two in a room, and $3.50 for one person in a room. Write early and secure your room. A smoker will be given the members, guests, and exhibitors on Thursday evening, July 19th, at 10.30.

Pennsylvania and the Central R. R. of New Jersey carry passengers from all points to Asbury Park. Over eight hundred dentists registered last year. Asbury Park is a splendid place on the sea-shore to spend your vacation, and the state society will give the best instructions to help you in your work throughout the year. Cut off your appointments from the 18th to the 21st and come and see for yourself.

Chas. A. Meeker, *Sec'y,*
29 Fulton st., Newark, N. J.

Notice from Clinic Committee.

An opportunity is afforded anyone having a difficult case in surgery, orthodontia, operative or prosthetic dentistry, to present the case for consultation at the coming meeting at Asbury Park, N. J., July 18th to 21st. It is hoped that advantage will be taken of this chance to gain the opinion and advice of men of exceptional ability in their special lines.

Correspondence is solicited. The committee desires a concise history of the cases on or before May 30th, if possible.

J. G. Halsey, *Chairman,*
Swedesboro, N. J.

CANADIAN DENTAL ASSOCIATION.

The Canadian Dental Association will hold its third bi-annual meeting in Montreal, Quebec, September 5 to 8, 1906.

C. F. Morrison, *Sec'y,*
Montreal, Can.

MAINE DENTAL SOCIETY.

The Maine Dental Society will hold its forty-first annual meeting at the Kineo House, Moosehead Lake, Maine, Tuesday, Wednesday, and Thursday, July 17, 18, and 19, 1906.

H. A. Kelley, *Sec'y,*
Portland, Me.

MICHIGAN STATE DENTAL ASSOCIATION.

The semi-centennial meeting of the Michigan State Dental Association will be held in Detroit, July 9, 10, and 11, 1906. A most cordial invitation is extended to all reputable practitioners to attend this fiftieth anniversary of the association, and a most interesting program is in preparation to celebrate this important occasion.

Edward B. Spalding, *Sec'y,*
Detroit, Mich.

WISCONSIN STATE DENTAL SOCIETY.

The thirty-sixth annual meeting of the Wisconsin State Dental Society will be held at Madison, Wis., July 17, 18, and 19, 1906. The program committee is arranging an unusually interesting program. Some of the most eminent men in the profession will be with us and all indications point to one of the best meetings ever held in Wisconsin. All ethical dentists are most cordially invited to attend.

W. H. Mueller, *Sec'y*,
21 W. Main st., Madison, Wis.

KANSAS CITY DENTAL SOCIETY.

The Kansas City (Mo.) Dental Society has appointed a committee to arrange for a great dental clinic, to be held February 22 and 23, 1907.

The committee is represented by Dr. J. P. Root, as president and the following chairmen: Essays—J. D. Patterson. Reception—D. J. McMillen. Clinics—F. G. Worthley. Smoker—C. L. Hungerford. Exhibits—T. E. Purcell. Finance—C. L. Van Fossen. Program—M. C. Carpenter. Publication—J. W. Hull. Arrangements—R. M. Seibel. Railroads—F. W. Franklin.

The chairmen of the different committees have been at work, even at this early date, and have arranged for quarters at the Midland, having secured the large banquet hall for the clinics, and enough other space for the exhibits, etc. Everything is being planned to make this greater than all former clinics.

The clinicians will be selected from among the most prominent men in their respective lines. One evening will be devoted to essays, limited to two in number, and will be given by men well known in scientific dentistry. A complimentary banquet will be given the clinicians and essayists by the local dentists.

The committeemen back of this undertaking realize its magnitude, and expect to exercise the necessary energy to push it to a successful end. All ethical dentists and dental societies are requested to keep the dates in mind, and to co-operate in making this a great dental gathering and the greatest of all practical dental clinics.

J. W. Hull,
Ch'man Pub. Committee.

IOWA STATE DENTAL SOCIETY.

At the forty-second annual meeting of the Iowa State Dental Society, held at Des Moines, the following officers were elected: Wm. Finn, Cedar Rapids, president; C. E. Woodbury, Council Bluffs, vice-president; Geo. W. Slingluff, Burlington, treasurer; C. L. Topliff, Decorah, secretary. The society will meet next year at Cedar Rapids.

C. L. Topliff, *Sec'y.*

ST. LOUIS SOCIETY OF DENTAL SCIENCE.

The St. Louis Society of Dental Science has elected the following officers for the ensuing year: Adam Flickinger, president; Emma Eames Chase, vice-president; Geo. H. Westhoff, secretary and treasurer; Richard Summa, curator. Board of Censors—E. P. Dameron, D. O. M. Le Cron, and F. S. McKay.

Geo. H. Westhoff, *Sec'y*,
2741 N. Grand ave., St. Louis.

CONNECTICUT STATE DENTAL SOCIETY.

At the forty-second annual convention of the Connecticut State Dental Association, held at Bridgeport, Conn., April 17 and 18, 1906, the following officers were elected: A. W. Crosby, New London, president; Fred'k Hindsley, Bridgeport, vice-president; E. S. Rosenbluth, Bridgeport, secretary; A. V. Prentis, New London, assistant secretary; W. O. Beecher, Waterbury, treasurer. Executive Committee—F. T. Murlless, Jr., Windsor Locks; F. W. Brown, New Haven; F. J. Erbe, Waterbury.

MISSISSIPPI DENTAL ASSOCIATION.

The thirteenth annual meeting of the Mississippi Dental Association closed Friday, June 8, 1906, the most successful meeting in the history of the association. Gulfport proved to be a most enjoyable place for the meeting.

The following officers were elected for next year: L. B. McLaurin, Natchez, president; L. A. Smith, Port Gibson, first vice-president; J. H. Phillips, Meridan, second vice-president; E. Douglas Hood, Tupelo, secretary; W. H. Reaben, McComb City, corresponding secretary; C. C. CROWDER, Kosciusko, treasurer.

The association will go to Meridian next year and will meet during the month of May. Great plans were suggested at the meeting whereby the Meridian meeting can be made still better, and it is the intention of the officers to try and eclipse anything ever before offered by any southern state.

For information at any time, address

E. DOUGLAS HOOD, *Sec'y*,
Tupelo, Miss.

NEBRASKA STATE DENTAL SOCIETY.

THE thirtieth annual meeting of the Nebraska State Dental Society was held in the Creighton Dental College, Omaha, Neb., May 15, 16, and 17, 1906. The following officers were elected for next year: Norman H. Morrison, Red Cloud, president; Horace Warren, Missouri Valley, Iowa, vice-president; M. E. Vance, Lincoln, secretary; H. T. King, Fremont, treasurer.

NORMAN H. MORRISON.

VERMONT STATE DENTAL SOCIETY.

AT the thirtieth annual meeting of the Vermont State Dental Society, held at Brattleboro, May 16 to 18, 1906, the following officers were elected for the following year: Geo. O. Mitchell, St. Albans, president; C. H. Kent, Barre, first vice-president; Harry F. Hamilton, Newport, second vice-president; Thomas Mound, Rutland, recording secretary; Grace L. Bosworth, Rutland, corresponding secretary; W. H. Munsell, Wells River, treasurer. Executive Committee—C. F. Meacham, A. Z. Cutler, and P. M. Williams.

The next meeting will be held the third Wednesday in May 1907, the place to be decided upon later.

THOMAS MOUND, *Recording Sec'y*,
Rutland, Vt.

DISTRICT OF COLUMBIA BOARD OF DENTAL EXAMINERS.

THE semi-annual examination of the Board of Dental Examiners for the District of Columbia will be held at the George Washington University, Washington, D. C., July 5, 6, and 7, 1906. Examination fee ten dollars.

SHELDON G. DAVIS, *Sec'y*.

RHODE ISLAND BOARD OF REGISTRATION.

THE Rhode Island State Board of Registration in Dentistry will hold its next meeting for the examination of candidates at the State-house, Providence, July 10, 11, and 12, 1906, beginning each day promptly at 9 A.M. Applications, together with the fee of twenty dollars, if first examination, should be in the hands of the secretary not later than July 3d.

W. S. KENYON, *Sec'y*,
301 Westminster st., Providence, R. I.

VERMONT BOARD OF DENTAL EXAMINERS.

THE next meeting of the Vermont Board of Dental Examiners for the examination of candidates to practice dentistry will be held at Montpelier, July 10, 11, and 12, 1906, commencing at 2 P.M. on the 10th. Headquarters will be at the Pavilion Hotel.

Application, together with the fee of $25, must positively be in the hands of the secretary before July 1st. Candidates for third examination must notify the secretary before July 1st, inclosing the fee of $5. For information, application blanks, and other blanks required, apply to

GEO. F. CHENEY, *Sec'y*,
St. Johnsbury, Vermont.

ARIZONA BOARD OF DENTAL EXAMINERS.

THE Arizona Board of Dental Examiners will meet at Tucson, Ariz., July 2, 3, and 4, 1906. Fee twenty-five dollars ($25).

WM. P. SIMS, *Sec'y*,
Bisbee, Ariz.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in Trenton, N. J., on July 9, 10, 11, 12, and 13, 1906. Practical and theoretical work must be all completed at that time. Sessions begin promptly at 9 A.M. each day. All applications must be in the hands of the secretary by July 1st.

For further information kindly address

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

MONTANA BOARD OF DENTAL EXAMINERS.

The next annual examination of the Montana State Board of Dental Examiners will be held in the city of Helena, July 16, 17, and 18, 1906. For further particulars communicate with

B. J. Keenan, *Sec'y,*
Butte, Mont.

SOUTH DAKOTA BOARD OF EXAMINERS.

The next meeting of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, S. D., beginning July 31st, at 1.30 p.m., and continuing through the days of August 1st and 2d. All persons wishing to take the examination must send in the examination fee of $10 before July 24th. Candidates must bring operating instruments, including dental engine, and such other appliances and materials as are necessary to do crown and bridge work.

G. W. Collins,
Vermilion, S. D.

ARMY DENTAL CORPS.

Contract Dental Surg. Ralph W. Waddell will proceed from Cotobato, Mind., to Parang, Mind., for duty. (April 6, D. Mind.)

Dental Surg. Croxton L. Rion is relieved from further duty at Warwick Barracks, Cebu, and will proceed to Camp Jossman, Guimaras, for duty. (April 9, D. Vis.)

Dental Surg. Rex. H. Rhoades will proceed to Fort Sheridan, Ill., for duty, relieving Dental Surg. Hugo C. Rietz, who will proceed to San Francisco, and take the first available transport for the Philippine Islands for duty. (June 2, W. D.)

So much of Par. 16, S. O. 131, June 2, 1906, W.D., as directs Dental Surg. Hugo C. Reitz to proceed to the Philippine Islands for duty is revoked. Upon his relief from duty at Fort Sheridan by Dental Surg. Rex H. Rhoades, Dental Surg. Rietz will proceed to his home, Manitowoc, Wis., for annulment of contract. (June 11, W. D.)

Leave for one month, to take effect on or about July 15, 1906, is granted Dental Surg. S. Davis Boak, Columbus Barracks, Ohio. (June 6, D. Lakes.)

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MAY 1906.

May 1.

No. 819,136, to John E. Herman. Tooth-spreader.

No. 819,137, to John E. Herman. Dental matrix-retainer.

No. 819,249, to Frederick C. C. T. A. Osius. Dental filling.

No. 819,641, to William S. Filley. Dental-plate machine.

No. 819, 678, to Bert G. Simmons. Dental waste-cotton receptacle.

May 8.

No. 820.025, to Daniel G. Steinecke. Electric dental furnace.

No. 820,045, to Valentine A. Gudex. Dental vulcanizer.

May 15.

No. 820,474, to William C. K. Buchanan. Mandrel for dental engine.

No. 820,781, to John F. Hammond. Suspended electric dental motor.

May 22.

No. 821,150, to Frank L. Argall. Dental swaging apparatus.

No. 821,192, to Carl Rauhe. Set of artificial teeth.

No. 821,354, to Theophil H. Gebauer. Inhaling apparatus.

THE

DENTAL COSMOS.

VOL. XLVIII. AUGUST 1906. No. 8.

ORIGINAL COMMUNICATIONS.

THE RELATION OF CIRCULATORY DISEASES TO GENERAL ANESTHESIA.

By ELI H. LONG, M.D., Buffalo, N. Y.

(Read at the union meeting of the Seventh and Eighth District (N. Y.) Dental Societies, Rochester, N. Y., October 31, 1906.)

WHEN we analyze the various conditions that are regarded as contra-indications to general anesthesia, we find that the anticipated danger usually threatens the integrity of some part of the circulatory apparatus. It is found also that the disturbances of respiration that may occur with any anesthetic are in themselves transient and readily amenable to treatment. And it is probably true that when death occurs with respiratory failure as the starting-point—as appears from the symptoms—it is really due to an attendant depression of the heart that does not permit resuscitation. Evidence in support of this belief is furnished in poisoning by opium, which drug paralyzes the respiration but is not a heart depressant. Here the respiration may be completely paralyzed for hours, but recovery may still occur through continued employment of artificial respiration. The explanation is that the heart is not poisoned by the drug, but maintains its irritability intact, unless affected secondarily by auto-intoxication. This must not be taken to mean that the condition of the respiration can be disregarded, for attention to that function is, in any case, one of the first and most important items of treatment. But in our study of antecedent conditions, the respiratory system occupies a place of secondary importance.

A fair state of integrity of the circulatory system, therefore, must be held to be the first requisite in deciding for general anesthesia; and, on the contrary, appreciable disease in the same usually constitutes an absolute contra-indication. But this does not mean simply disease of the heart, for valvular disease of that organ is not only the most easily recognized, but in many cases the least dangerous of the heart conditions that may be present. It is not simply a question whether heart disease is present, but whether the circulatory conditions as a whole admit of the use of an anesthetic. From this it appears that to decide as to the fitness of an individual for the employment of a general anesthetic is not always an easy matter. It cannot be done by the application of rules.

One chief purpose of this paper is to emphasize the fact that it is not enough to listen to the heart and respiration. It is so easy to rest our case upon the absence of a heart murmur, that we may overlook more serious but less perceptible disease. Analysis of the circulatory apparatus shows three distinct elements, viz, heart, bloodvessels, and nerves. No one of these should be regarded as of minor importance. We must pay due regard to the innervation of the heart and bloodvessels, and as well to the state of the arterial system. The matter of irregularity of the heart's action, which when due to nervous influences may be of minor import, when due to degeneration of the heart muscle and representing an irregular response on its part, may be one of the most serious indications of a structurally diseased heart.

Arterial blood pressure is a very important factor. It may seem presumptuous to venture the suggestion that death may occur through the extreme reduction of blood pressure by paralysis of the vaso-motor nerves; yet Dr. Crile of Cleveland concludes from careful experiments that one prominent factor in surgical shock is depression of the vaso-motor system by exhaustion of the centers. And we must recognize the fact that our most powerful heart depressants—such as chloroform and chloral—also depress the vaso-motor nerves. In contrast to these, again, opium has very little influence upon these nerves, and is accordingly a safer drug.

When a case presents for general anesthesia, the appearance of the patient may give a hint as to the presence of serious pulmonary disease or of kidney disease, though not always; but it may be stated that the majority of persons having disease of the circulatory system, if well enough to be about, give little evidence of the disease in their general appearance. To explain this, the fact stands that the heart possesses the largest compensatory resources of any organ in the body. Situated so as to receive the most abundant blood supply, it is capable of hypertrophy to the degree of compensating very great valvular defects. Therefore we may have a normal circulation in spite of the existence of a leaky valve or a slight narrowing of an intracardiac orifice. Many people have just such a condition and are still capable of doing their part of the world's work. We occasionally have to face the question of their fitness for anesthesia.

What considerations will guide us in deciding the question? The meaning of the heart murmur will naturally claim our attention first. Many heart murmurs are called functional because they do not represent any discoverable organic disease. They are not attended by any symptoms, or by compensatory hypertrophy. They do not modify the character of the first sound of the heart as heard at the apex, but are heard most prominently over the base. A murmur of this kind does not constitute a contra-indication to anesthesia.

Of the lesions that give rise to murmurs, a leakage of the mitral valve is the most common. It fortunately is the least serious of all the valvular and orificial defects, in the sense that it is most readily compensated, and often perfectly. Given a murmur of this kind, the question of giving an anesthetic will be determined by the considerations of perfect compensation with absence of symptoms, the urgency of the need of general anesthesia, and the kind of agent to be used.

Two dangers must be considered: First, that of depressing a heart that is already at a disadvantage, and second, that of lessening the oxygenation of the blood, which might lead to embarrassment of the heart by distention of its chambers; for venous blood does not pass readily through the capillaries. Nitrous oxid as usually given, without oxygen, would present the latter danger, and chloroform the former, because of its marked depressant action upon the heart. In other words, when an anesthetic is permitted, it must be the one that will be the least disturbing to normal circulatory conditions.

In stenosis, or narrowing, of the mitral orifice, and in lesions of the aortic valves, the circulation is more likely to be abnormal, and the probability of continued compensation is less; therefore the above consideration will apply with added force, and anesthesia is admissible only with the most careful discrimination.

The condition of the bloodvessels claims careful attention, for the important reason that they furnish a fairly reliable index of the progress of the degenerative changes in the system as a whole. The changes which they are most subject to are essentially those of age, whether they represent a normal senile degeneration late in life, or an earlier disease of the arteries due to such causes as syphilis and alcoholism. So definitely has this come to be recognized as to lead to the axiom that "a man is as old as his arteries," meaning that a man may be old at forty because his arteries show the changes that belong to advanced life. The general name arterio-sclerosis is given to the condition. The changes consist of a hardening, a weakening, and a compensatory thickening of the vessel walls; in consequence they become less elastic and less fit to stand the strain of the increased blood pressure that naturally accompanies the disease.

The diagnosis of arterio-sclerosis is based largely upon the palpable thickening of the radial and temporal arteries, with accentuation of the aortic second sound of the heart, which indicates high arterial blood pressure.

Two dangers must be noted as attaching to arterio-sclerosis in relation to general anesthesia: First, with the lessened oxygenation of the blood that occurs when the supply of air is limited in the administration of an anesthetic, the blood pressure is believed to be increased in the areas of the smaller vessels—the arterioles—because a blood poor in oxygen and surcharged with carbon dioxid stimulates the circular muscle fibers of the arterioles to contraction; thus the blood is held back in the smaller arteries instead of passing freely on into the capillaries. If the vessel walls be weakened by disease, the local increase in blood pressure may cause rupture, which, if occurring in the brain, would mean apoplexy. This danger has been recognized for some time as pertaining particularly to the use of nitrous oxid, because of the attending cyanosis, so that arterial disease is commonly held to be a contra-indication to nitrous oxid. Second, another danger, more obscure as to its recognition, is that of degeneration of the heart secondary to arterial disease. It may not be apparent by the usual means of physical diagnosis, for under ordinary influences the function of the heart may not be sensibly disturbed. The danger cases are precisely of the kind that terminate in sudden death in the midst of life's activity. Degeneration of tissues has begun, and we can think of such a case as one where death has laid its finger upon parts of the body that are not in themselves so vitally important, but which, by progressive changes, originate secondary influences that affect the most vital structures of the nervous system and heart. It is worth while to study for a moment the sequence of effects that have their origin in the vascular changes of advancing years or of earlier vicious alteration of nutrition.

There is to be noted prominently the fact of the gradual hardening of the coats of the vessels, with the result that an important function of the arteries is largely lost. It is that of expanding with the pulsation of the heart, so as to accommodate a larger amount of blood, and of distributing the same during the period of heart rest, by virtue of the natural elasticity of their walls. In other words, the reservoir and distributive function of the arteries, which normally secures an even flow of blood into the capillaries, may be greatly diminished. The picture of a system of metallic tubes would present an exaggeration of this condition of the arteries, but to a degree the simile would be true, for in some cases the disease proceeds to extensive calcification of the walls, producing what is known as "pipestem arteries." But in our typical case the time comes when the rigidity is sufficient to give, in effect, an intermittent supply of blood to the capillaries, instead of the normal uniform supply. The force of the circulation is thus broken intermittently just at the most important point, *i.e.* where the cells are to be nourished. With the intermittent supply of blood, the changes of fluids in and about the cells—which belong to their nutrition—become less constant and uniform. Consequently, cell nutrition, cell elimination, and oxidation are less active; and the blood, instead of gaining its material and losing its waste products through the normal activity of these processes, suffers an accumulation of deleterious matter, becoming gradually unfit to properly serve the tissues of the body.

Remembering that the cells of the tissues—the capillary areas if you please—constitute the real laboratory of the system, with each cell as an individual worker; where the blood brings the materials and carries away the waste products; where oxidation and other chemical processes change harmful substances to harmless; where tissue-building and the destruction of used tissue elements keep pace, we can understand that constant and increasing interference with vital changes here must result in a progressive vitiation of the blood current. Now, if we reflect that the heart must depend upon this same blood for its nourishment, and add to this the further fact that the vascular changes are particularly liable to be advanced in the coronary arteries of the heart, contributing a factor of diminished quantity of blood to the heart muscle, we have a reasonable basis for the secondary degenerations of the heart structure, which become so serious an element in anesthesia. The organ may be in a condition where either a sudden strain or a sudden depression may prove fatal.

It should be noted that this state of affairs is often unsuspected by the patient and undiscovered by the physician, sometimes through laxity in examination and sometimes because it is not discoverable. These cases do not commonly present a heart murmur until dilatation of the left ventricle occurs. As to the symptoms that betoken advanced cases, there may be mentioned irregularity of the heart's action, weakness of the first sound, with palpable evidences of dilatation of the chambers.

What about the use of anesthetics in these cases? Upon a basis of the foregoing study, we will all agree that in the discoverable cases of degeneration of the heart general anesthetics are contraindicated. But with our greatest skill and our best efforts, we shall not be able to prevent occasional surprises in cases where a serious condition cannot be premised. In the case in which any question of safety arises, our judgment must be concerned about the choice of an agent no less than about the condition of the subject, for it does not follow that if our judgment interdicts one agent it must prohibit all. Here we must apply the rule that the drug that is least liable to disturb circulatory conditions should be given first place, providing it does not unduly increase the danger of toxemia, either directly by its own action or by embarrassing elimination.

The objection to nitrous oxid that it induces asphyxia, can be overcome by combining sufficient oxygen with it to maintain a good degree of oxygenation of the blood, with which modification it is unquestionably the safest of all agents wherever it is applicable.

The chief objection to ether that is held to be a real danger—that of the large amount needed, which may seriously tax the eliminative organs—may be largely removed by preceding its use by either ethyl chlorid or nitrous oxid. The fact that it is not a heart poison gives it a place of permanence as the safest known agent for a profound, continued effect. It induces practically no disturbance of circulatory conditions.

The objections to chloroform have reference to its circulatory effects chiefly. While experimental evidence shows that chloroform kills the healthy mammal by paralyzing respiration—and cases are seen where, respiratory failure occurring under this drug, the patient is promptly resuscitated by artificial respiration—yet its great danger lies in the fact that it greatly depresses the heart, and its free or prolonged administration may cause fatty degeneration of that organ. The irritability of the heart muscle is also reduced, so that its response may be deficient. With chloroform, therefore, when respiration stops we have to reckon not only with a paralyzed respiration, but with a depressed heart as well. The odds may be too great for the organ to recover itself, hence the frequent fatalities from this anesthetic.

The chief objection to ethyl chlorid, which is put upon the market under a variety of names, is that it is still a new agent. Reports of its use in some thousands of cases indicate that it is safer than chloroform. We cannot expect it to be as safe as ether, but with the small quantity needed it thus far compares favorably with the latter.

In concluding this paper, I want to take a stand in advocacy of the teaching of physical diagnosis in dental schools, not theoretically simply, but by actual cases. A familiarity with the normal cardiac and respiratory sounds is particularly valuable, so that a departure from the normal may be appreciated. But I have no expectation, by such a course, of making the graduate in dentistry capable of accurate diagnosis of conditions within the thorax, or of deciding as to the admissibility of anesthesia in a person who presents anything abnormal; for that is impossible of attainment without a thorough course in general medicine and the added observation of many cases in practice. However, what may be expected from such a course is still considerable: it is the ability to detect a departure from the normal, so that medical opinion may be availed of before anesthesia is employed.

REPORT OF A CASE OF DOUBLE RESECTION FOR THE CORRECTION OF PROTRUSION OF THE MANDIBLE.

By VILRAY PAPIN BLAIR, M.D., St. Louis, Mo.

THE operation was performed December 19, 1897. In this report I will not go into any detailed consideration of these cases as a class, as I intend at an early date to publish my observations on deformities resulting from developmental mal-relation of the jaws, giving an outline description of the pathological anatomy, and of various operations devised for the correction of the different conditions. The operation in this particular case has been reported, quoted, or commented upon at length about twenty times in dental literature and text-books that I know of, and I believe a true report of the case and the circumstances under which it was performed will make a fitting preface to the papers to follow.

The subject of operation was twenty-two years of age, of good personal and family history, apparently inclined to be serious and diffident. These traits, I believe, could be partially traced to the facial deformity. Some time between puberty and twenty-one years a bilateral growth had occurred in the length of the horizontal ramus of the mandible in one place on each side; that on the left side was between the first and second bicuspids, with a space of one-fourth of an inch between the crowns; that on the right was between the bicuspids and the molar, and was not as great. There was no special separation between the other teeth. The lower third molar articulated squarely with the upper first molar, showing that the mental protrusion was not entirely due to the growth, but that the whole of the tooth-bearing portion of the mandible was in mesial occlusion. There was also a marked lingual inclination of the incisors, the direct result of pressure of the orbicularis oris upon these very prominent teeth. This together with the angling at the site of the abnormal interdental spaces produced an obliquity of the chin, so that while the lower incisors were but one-fourth of an inch in front of the upper incisors, the lower mental border protruded much farther. The cutting edges of the incisors overlapped fully one-eighth of an inch.

The object to be obtained here was both to shorten the horizontal ramus and to change the mental angle. The question was how this could be done. I learned later that before the patient came to me he had been wearing—at the advice of J. W. Whipple, D.D.S.—an apparatus of Dr. Angle's, but not with the latter's sanction; this device, worn for a certain number of hours each day, produced backward pressure upon the mental portion of the mandible. While it has proved eminently satisfactory in cases of the very young, it was not efficient here applied to hard, mature bone. The patient did not mention what other measures had been proposed.

If the jaw was too long, the natural solution was to remove a portion of it. The questions that presented—could it be cut out satisfactorily? and if that were done would the structures in the anterior portion of the mandible suffer from division of the inferior dental nerve? and could the growth recur?—were disposed of thus: As to the first question I satisfied myself by experiments upon cadavera; the second by analogy, and the third by the fact that at his age bony growth should be complete. Drs. E. H. Gregory and Paul Tupper both concurred in my reasoning. With these opinions, and on account of the disfigurement, the difficulty in eating due to lack of function of the incisor teeth, and especially of the very imperfect enunciation, the patient decided to have the operation performed.

Under chloroform anesthesia the patient's head was drawn over the end of the table until the shoulders rested on the edge. The head was thrown back and the mouth drawn open, and both the head and mandible were held by the hands. I had devised for the bone cuts a double-bladed saw, the blades of which could be separated and fixed at any desired distance from each other, hollow-ground so as not to bind in the bone, and probe-ended. The skin on the under surface of the chin at a point corresponding to the intended bone cuts was drawn slightly up on the face, and an incision five-eighths of an inch long was made along the outer inferior edge of the horizontal ramus. This incision was extended up into the mouth, passing along the outer surface of the horizontal ramus and cutting the mucous membrane at the bottom of the buccal alveolar *cul-de-sac.* The result of this skin-drawing was that, when released, the wound slipping back under the chin rendered the scar almost invisible. The double-bladed saw was passed through this incision, and the bone, with its mucous and submucous coverings, was sawed. When the first double cut extended three-fourths of the way through, a similar incision was made on the opposite side, and corresponding cuts of similar depth were made in the bone. With a rapid mechanical drill, holes for wiring were made near the inferior border of the bone, the saw was replaced, and the sections completed. The mental portion of the mandible was now perfectly movable. Copper wire was passed through the drill holes and the bones were drawn together. This procedure when properly carried out corrects lateral as well as forward protrusion. The teeth contiguous to the cuts were wired together for the upper fixation. Now, this did not make the newly constructed arch perfectly steady, nor had it been anticipated that it would. It was intended to use the maxilla as a splint for the new mandible. Owing to the peculiar elongation of the mental portion of the mandible and of the incisor teeth, it was found that after changing the angle of the chin and bringing the incisors to a proper position as indicated by facial outline, the teeth behind the cuts were separated from those above by distances varying from almost nothing posteriorly, to one-fourth of an inch anteriorly. This had been foreseen, and the space was filled with softened gutta-percha upon which the jaws were closed, it being allowed to harden *in situ*. This made a perfect splint, and when the lower teeth were firmly wired to the upper ones in appropriate places, the mandible was immovable. This mode of fixing the mandible was suggested to my mind by seeing Angle's fracture-bands. The patient in these cases is fed by fluid drawn between the teeth.

Had it not been for an unfortunate accident, I am sure that this is all that would have been required, and that union would have occurred within three or four weeks. Though ordinary precautions had been taken to prevent the accident, the patient several hours after coming from under the anesthetic vomited a quantity of mucus and blood, which necessitated the cutting of the wires which bound the mandible to the maxilla. Then the mistake was made of replacing these wires with a Barton's bandage of plaster. The patient's stay in the hospital was uneventful. He was nourished with liquids, and the clinical chart, which is on file at the Missouri Baptist Sanitarium, shows that he was anesthetized at 9.20 A.M., and returned to his room at 10.30 A.M., giving one hour and ten minutes for the anesthetic and the completion of the operation. There is no record of his having suffered pain, nor that he received at any time either an opiate or a sedative. Twice his temperature reached 101.2°, but most of the time it was normal. The recovery was uninterrupted until the occurrence of the second accident, which I shall give in detail later.

I am sorry that before Dr. Whipple made his original report of this case—this appeared in the DENTAL COSMOS for July 1898, while I was not in this country—he did not consult someone who was present at the operation, as it would have detracted from neither the interest nor accuracy of his report. Personally I had never had the pleasure of meeting Dr. Whipple until I went to his office, a few days prior to the operation, to invite him to be present, as I knew he had previously seen the case. I regret that he was not there when it was performed. His statement that "the means adopted for holding the superior borders of the dissevered maxilla in position had proved to be entirely ineffective," and that "the parts had failed to unite on either side," is untrue.

I wished to discard the plaster bandage on account of the mental worry it caused the patient. Upon its removal there was apparently bony union on the right side, and a very slight but perceptible motion on the left when the fragments were grasped. It was my idea that two dental bands with a bar between them crossing the weak place would afford sufficient support to allow him to go without other protection. I accompanied him to Dr. Whipple's and requested the latter to carry out this idea for me. This was the first time I consulted Dr. Whipple in the case. The bands were placed upon the teeth contiguous to the weak section, and through rings on the outer side of these bands a bar was placed that had on it a continuous thread to carry the nuts that held it in place. In drawing on these nuts, the force caused a separation, and there was union on neither side. Dr. Whipple broke the union of the provisional callus. I said nothing, but the patient mentioned the fact as he left the office. The plaster was reapplied and Dr. Whipple also applied properly adjusted buckles; after several weeks the union was again effected. He also crowned the lower teeth posterior to the cut so that they would occlude with the upper, and filed some points to improve the occlusion of the incisors.

I crave pardon for this digression, but the article referred to is somewhat misleading. In this case the bone sections were made at the site of the abnormal growths. That on the left, being broadest and being situated between the bicuspids, was taken as a gage, and a section nine thirty-seconds of an inch was removed from each side. On the right, the space between the bicuspid and the molar was not so great, and the second bicuspid was removed. Besides, there was a shooting forward of the whole mandible, and the amount removed was not sufficient to entirely correct the deformity; you will still perceive some lateral projection. Besides this, the only abnormality existing now consists in almost the complete loss of cutaneous sensation in the lower lip—the area supplied by the inferior dental nerve through the mental foramen. The sensation of the tooth-pulp is good.

Fig. 1.

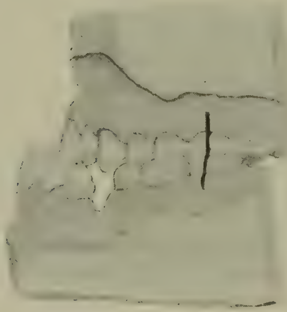


Fig. 2.

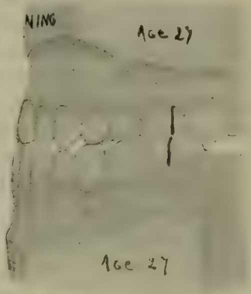


Fig. 3.

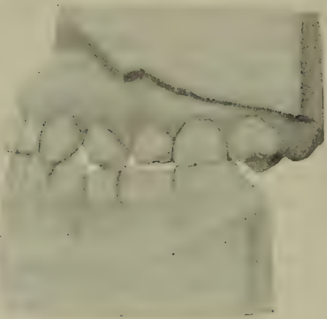


Fig. 1 represents the casts of the patient's jaws before the operation. Fig. 2 shows the present condition with the molars capped with the gold crowns. Fig. 3 shows what this condition would be after proper orthodontic treatment of the incisors and canines. Here the gold crowns have been removed, the lower incisors shortened, and the upper incisors moved forward to a proper position. This of course is done on the cast, but it would have been perfectly practical had it been done—and even now it could be done—on the patient. I would have followed this procedure at that time had I then possessed a proper knowledge of the subject. The facial outline as it is would admit of this change to advantage.

Dr. Angle had been consulted in this case before I had ever seen it, and he tells me that he had advised such an operation, but neither of these facts did I know at the time.

The operation then seemed to me of small moment, but the attention it has attracted and the discussion that has resulted caused me to go deeply into the subject of facial deformities resulting from mal-relation of the jaw-bones. To me, the study and the results have been most interesting.

PORCELAIN INLAYS, WITH SPECIAL REFERENCE TO CAVITY FORMATION.

By C. S. VAN HORN, D.D.S., Bloomsburg, Pa.

(Read before the Susquehanna Dental Association, at Allentown, Pa., May 23, 1906.)

FOR several years the porcelain question has been absorbing the attention of progressive dentists throughout the world. Our journals have so teemed with it, and it has been such a prominent topic at society meetings that little, if anything, would be left to be said were it not for diversity of opinion, skepticism, and extravagant claims.

Failure in porcelain inlay work is usually the result of following principles which are based upon unsound theories, for it is a fact established by experience that inlays are sufficiently permanent to justify their use where indicated, providing that cavity formation has received the consideration which is absolutely required, and that careful attention is given to every detail.

Success in this work depends not on any peculiar advantages of the cement—as setting under pressure—in retaining inlays in position, but on a thorough comprehension of adequate cavity formation.

Cavities come to us not made to order, but in all shapes, sizes, and conditions. It is not my intention to attempt to cover the entire field or to go into extended detail, but rather to emphasize the importance of securing adequate retention by depending on tooth-structure to resist, either directly or indirectly, the occlusal force, and to endeavor to elucidate the fundamental principles involved.

To obviate the monotony of repetition and at the same time make clear the principles I desire to impress, I have prepared in plaster casts a few of the more common cavities, which I submit for your inspection and consideration. These cavities are the result of a careful selection from all available sources at my disposal, and while I am not claiming universal applicability or perfection in every particular, I do contend that the formation can be approximated, and the nearer the approximation the greater will be the chances for success.

Cavities not subject to occlusal stress require flat or convex floors, with side walls at an angle slightly greater than a right angle. (See Figs. 1–4.)

Where stress is to be resisted the cavity should be so shaped that the occlusal force will tend to drive the inlay against solid tooth-structure—more firmly to place. This can be accomplished—taking a simple approximo-occlusal cavity as an example—by forming the gingival seat at right angles to the long axis of the tooth, the pulpal wall parallel to the long axis, the incisal wall at an obtuse angle to the gingival and pulpal walls, and what remains of the labial wall at right angles to the pulpal wall, a groove being cut in the gingival seat at the juncture of the pulpal wall. It will be observed that in these cavities the inlay goes to place in the direction in which occlusal force is applied; the greater the force the closer the adaptation of the inlay to the cavity walls and margins. (See Figs. 5 and 6.)

Where the incisal angle is involved, trim the lingual wall a trifle in excess of the labial wall, and form a broad flat gingival seat, into which cut a groove as deep and broad as is consistent with the strength of the tooth; the axial groove in like proportion is extended incisally from the gingival seat two-thirds or three-fourths the distance to the incisal edge of the tooth, the lingual and incisal walls of this groove being formed at an obtuse angle to the axial floor and the labial wall at right angles to the axial floor. To dislodge an inlay from this cavity would require direct lateral force, and as this force is slight, it is overcome by contact with the adjacent tooth and the adhesion of the cement. (See Figs. 7–10.)

FIG. 1.

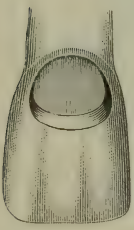


FIG. 2.

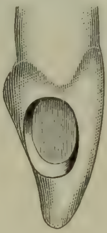


FIG. 3.

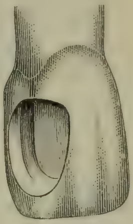


FIG. 4.

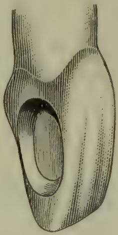


FIG. 5.

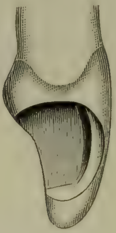


FIG. 6.

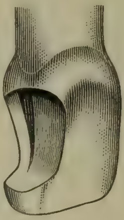


FIG. 7.

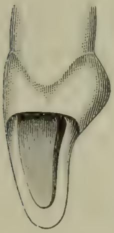


FIG. 8.

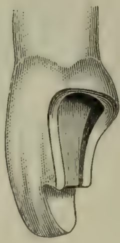


FIG. 9.

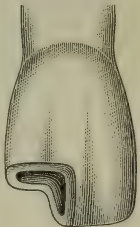
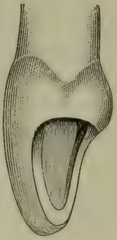


FIG. 10.



Angular cavities with a definite seat not only tend to hold the inlay securely, but assist materially in securing a perfect matrix by either the swaging or burnishing method, or both.

After adapting the matrix with spunk, etc., it is firmly packed with gum camphor and withdrawn, the camphor burned out, and a layer of foundation porcelain fused to a glaze into it; it is then replaced in the cavity, securely held in position by exerting firm pressure with a suitable instrument on the layer of fused porcelain, and carefully but firmly pressed and burnished against all walls and margins. The baking and burnishing are continued until all cavity edges are evenly covered.

It will be readily seen how difficult it would be for the matrix to change position in any of the cavities I have exhibited. I have made inlays requiring seven and eight bakings, the matrix being re-burnished after nearly every bake, and the result has been invariably a well-fitting inlay with close joints. It is needless to say that I use platinum foil for the matrix.

In cervical cavities, particularly those extending well up under the gum margin, and those extremely sensitive, a combination of the swaging and burnishing methods is employed. A die is secured, the matrix swaged to position, and a layer of foundation porcelain fused to a glaze into it; the matrix is then trimmed as close to the cervical margin of the cavity as it dare be, placed in the cavity, and burnished. The porcelain protects the sensitive dentin, and the cervical overlap of the matrix, being so narrow, slips in position without impinging on the sensitive gum tissue.

If after preparing a cavity there is the slightest doubt as to its correctness in any particular, take an impression of it in temporary stopping. By having the cavity moist and the gutta-percha not too soft, it will not stick, takes but a moment to harden, and when carefully withdrawn gives an accurate impression. It has helped me out of many a tight place, and not infrequently shows where I can improve the shape, change an angle or deepen a groove. If desired, it can be built to contour, showing the inlay as it should appear when completed.

If those who depend on faith—so to speak—to hold their inlays, would make a practice of constructing a gutta-percha inlay for each cavity, then with a suitable instrument exert in an occlusal direction just a little force, and see how easily this perfectly fitting inlay is dislodged, there would, I think, be less dependence on fol-de-rol notions, and more upon principles based on at least a small quantity of common sense.

All approximal inlays should be contoured to fully restore the contact point, and in large restorations it is advisable to over-contour slightly in this respect, as it assists materially in resisting lateral force.

Previous to cementing, the cavity surface of the inlay should be thoroughly etched with hydrofluoric acid, and where possible—without weakening it—the inlay should be grooved. The cavity should be undercut in the same manner as though the entire filling were to be of cement, and the inlay is ready for cementation; and here is the only instance in the whole procedure in which "crystallization under pressure" should receive the slightest consideration. I desire to impress the fact that "crystallization under pressure" is a potent factor only when in conjunction with a cavity of retentive form—not in saucer-shaped cavities—and should be considered only when cementing the inlay in a properly formed cavity. In cementing, about all the pressure the inlay will withstand should be exerted, and inlays for angular cavities will withstand considerable force.

The best method I have found by which to seat an inlay is waxed silk ligatures tied tightly around the tooth, with the addition, where possible, of still further pressing the inlay home with a soft pine stick suitably shaped.

Inlays for angular cavities with a definite seat go to place easily, and with a degree of certainty as to position that cannot be expected in those of the spherical, "seatless" sort, in which so much care has to be exercised to prevent one edge from protruding and the opposite one from being depressed.

I consider it a much more difficult task to make a well-fitting inlay for a shallow spherical cavity than for a cavity with self-retentive features, for it is next to impossible, for me at least, to make an inlay that will pass inspection without re-burnishing, and to hold a matrix in a "saucer" is a feat I have not accomplished.

In vol. xlvi, page 547, DENTAL COSMOS, Dr. Herbert L. Wheeler says: "The present method of making porcelain inlays to fit the cavity by means of fusing porcelain, glass, etc., in platinum or gold matrices which have been previously made to fit the cavity by pressure and burnishing, was originated by Dr. Wm. Rollins of Boston, and first described by him in a paper read before the Society of Oral Science in June 1880."

Since then twenty-six years have elapsed, and in the face of extravagant claims, such as: "Pluggers are a thing of the past;" "Porcelain is only limited in application by the limitations of the operator;" "There will never be recurrent caries about a porcelain inlay;" "If you believe in porcelain inlays at all you must believe in them everywhere;" "For those cases in which it would be a physical impossibility to prepare a cavity for a cement filling good permanent work can be done with porcelain;"—I yet say, in the face of these and other extravagant claims, that porcelain has won a meritorious place in the field of dentistry. And why? Simply because the conservative pioneers—and there are a number to whom we owe an everlasting debt of gratitude—demonstrated beyond doubt that porcelain has merit when properly employed, and by so demonstrating have created the present demand by an enlightened, cultured, and appreciative people.

The operator who is not making porcelain inlay work a component part of his daily *régime* is standing in his own light defeating his best efforts. I am free to confess that we have not a perfect porcelain body at our disposal, neither have we a perfect cement, but what we have deserves the attention and earnest consideration of all who value their reputations as up-to-date practitioners and who desire to serve their *clientèle* in the best manner possible. There are a number of good porcelains in the market, and, by selecting those that best suit individual peculiarities, good creditable work can be done, patients relieved of much fatigue and suffering, and last, but by no means least, a tooth can be more nearly restored to its natural condition—thus substituting beauty for disfigurement.

In this short paper I have emphasized the importance of depending on flat seats and floors with right-angle walls to retain inlays against masticatory stress, using cement only as a necessary adjunct, and have shown how inclined planes can be so placed as to facilitate adaptation. If I have succeeded in this paper in rendering intelligible the elementary principles which are governed by these well-known mechanical laws, and if the means that may lead to more perfect results be commended to more general adoption, I shall feel well repaid for my efforts.

A PLEA FOR CONTINUED EFFORT IN THE FIELD OF DENTAL LITERATURE.

By **I. N. BROOMELL, D.D.S., Philadelphia, Pa.**

(Read at the quarterly clinic of the Maryland State Dental Association, held at Baltimore, December 9, 1905.)

THE invitation received through your committee to come here and present a paper was, as is usual in such cases, unaccompanied by a suggestion regarding the subject, the object, or the nature of the composition, and it was this fact which largely influenced my own selection of the above title. I believe I voice the sentiment of a majority of those present—at least a majority of those who are or have been in the habit of contributing to dental literature—when the statement is made that the selection of a subject is perhaps the most perplexing part of such an undertaking. I say undertaking, because I believe that the time has come when the man who makes up his mind to contribute something of interest to dental literature finds himself confronted with a task not easy of accomplishment. We frequently hear it said, and with a certain sense of truthfulness, that in dental literature of today the topics discussed and written upon are to a very great extent but a repetition of the literature of the past. If this be true, one is inclined to weigh very carefully the results or effects of an anticipated production before entering upon its preparation. I am informed that this same condition of affairs is to be found among other learned or professional callings, and of course, when we consider that there is "nothing new under the sun," we are compelled to favor the idea that everything discussed or written upon is but a repetition of that which has been done before. No specialist in the science of medicine has such a wide field to draw from in his delving for information as has the general practitioner, and this may be offered as a sort of defense for the dental specialist in his possible disposition to reiterate. The scope of the dentist's work is so limited, and the tendency to criticism so pronounced, if he goes beyond his bounds, that it is with but little wonderment that we note the so-called repetitions. While dental literature should no doubt be largely devoted to matters pertaining directly to dentistry, a very liberal number of collateral subjects could be used with impunity and advantageously. There is no disposition upon the part of the writer to depreciate what is being done or what has been done by contributors of the present and the past, because it is largely through this channel that we have arrived at our present state of perfection; but nevertheless we are met face to face with the frequent statement that a condition exists which I believe requires careful consideration and refutation. That is, what course shall we pursue, what subjects shall we consider, in order to reap the greatest amount of benefit in the shortest time? One class of men feel amply repaid for the time expended in reading an article of considerable length, if they have learned therefrom a single point with which they were previously unfamiliar. Such men are content to obtain their information in this way. Another class prefer to have the essence of such articles extracted and presented to them in concise form, considering all time given to voluminous articles as wasted or misappropriated.

The principal object in presenting this subject is to learn if possible to just what extent the subjects written upon today constitute a repetition of the treatment of the same subjects in the past. In doing this the stand will be taken that while to a great extent the same subjects are receiving consideration, they are being treated with much more exactness and with a much better understanding than ever before. While this is all true, our knowledge regarding very many subjects is far from satisfactory, and for this reason I shall argue against the idea that there is nothing left to write about. With a view to upholding this position, I shall quote and compare some of the articles written upon various subjects of threescore years or so ago with those discussed today. We need go no further back than this; in fact it is believed that sufficient evidence could be found within the past twenty-five years to bring about a very convincing argument in my favor. This comparison in regard to the understanding of certain subjects of a few years ago with those of the present time will show that the progress of science of any kind is "never sudden and palpable, but always slow and insensible."

It is not very many years since Hunter declared the human teeth to be destitute of a living principle, and without an internal circulation, yet today we know that the teeth do not differ materially from other parts, being endowed with a circulation and a goodly amount of vitality. Harris was among the first to take exception to Hunter's ideas in this regard, supporting his argument by citing the following simple experiment: "In the operation of cutting off the crown of a tooth for the purpose of engrafting a new one," he observed a flow of blood from the "internal cavity," meaning the pulp-cavity. In commenting upon this he said, "For what other purpose, then, but to impart some principle of nourishment can so much blood flow to the teeth?" How much have we advanced since Harris made this assertion? How much better are we informed in regard to a definite circulation within the substance of the hard tooth tissues? Most histologists of today appear to be content with the knowledge that the pulp of a tooth is richly supplied with bloodvessels, and to make the assertion that "the dentin is extensively invaded, so to speak, with a soft plasmic material derived from the pulp, by which it is not only nourished but also rendered highly sensitive." In this, therefore, we have one field that will permit of further and fuller investigation.

In an article written in 1840 upon the shedding of the teeth, we are told that the pressure of the permanent teeth against the roots of the deciduous ones is responsible for the absorption of the roots of the latter. Also about the same time another writer said that the destruction of the roots of the deciduous teeth was due to the presence of a solvent fluid, and that the presence of, or pressure from, a permanent tooth was not essential to the process. Further comment upon the same subject about the same time asked the question and left it unanswered: "Is there a dissolving fluid that acts chemically on the surrounding parts, or do the absorbents, without any intermediary, destroy everything that would obstruct the shooting up of the tooth?" Some sixty years have elapsed since the above ideas were advanced, and while we are aware of the presence of a vascular papilla as the absorbent organ, or the active agent in the process, the exact manner by which the roots of the deciduous teeth are absorbed still remains a mystery, and herein lies another field for additional study.

In the time of Fox and Harris the opinion prevailed that the teeth as they advance in growth find their way through the gums by their own mechanical pressure. Goodsir and others claimed this process to be under the control of the gubernaculum, this cord dilating, and thus giving egress to the tooth. Since that time various opinions have obtained regarding the cause of the eruption of the teeth; the elongation of the pulp or growth of the root and the contraction of the walls of the tooth-follicle being the reasons most frequently given. While it is the opinion of the writer that the process may be explained by the expression so frequently employed that "function governs organization," and for this reason the dental organism is not complete until the teeth have located themselves in their respective places in the alveoli, this is of itself rather indefinite. In order to show that this subject is another which will permit of further investigation and study, it is only necessary to quote from a textbook published within the last two years, which says, "The whole subject is far from being satisfactorily settled."

In 1846 a writer of considerable note made the statement that "The gums are subject to several diseases peculiar to themselves, besides other affections which may be considered as the index of constitutional derangement," "the nature of which is somewhat mysterious." "The alveoli of the teeth have also their distinct diseases and are liable to be affected by diseases of the constitution." In the above we recognize symptoms which are now collectively called pyorrhea alveolaris. We have succeeded in selecting a name for the condition, one which sounds scientific and elegant, but how much more do we know positively regarding the etiology of the affection? Perhaps no other subject in dental or oral pathology has received the same amount of attention in recent years as has this one. The literature upon the subject is voluminous and perplexing, so much so perhaps, that one in attempting to write further upon the subject feels almost guilty of adding to the confusion. But there should be no hesitation in doing so, because as the subject now stands there are at least three separate and distinct views regarding the cause of pyorrhea alveolaris, any one of which may be right; but likewise all may be wrong. They are—note the doubtful way in which they are spoken of—"constitutional of some kind, local of some kind, and infectious of some kind." While this subject appears almost worn threadbare, we should encourage and welcome further literature bearing upon the cause or causes of this very prevalent malady. Nor is the etiological factor regarding pyorrhea alveolaris alone unsettled. While a goodly proportion of dental literature has been devoted to the consideration of a rational treatment of the condition, to a very great extent the treatment of today differs but little from that employed several years ago, and perhaps with but little better results. In 1846 the following advice was given regarding the treatment of this disease: "Remove the living substance from the internal cavity." (Destroy and remove the pulp.) "See that the teeth hit squarely upon each other." (Correct the occlusion.) "Remove all local cause of irritation, and make use of an astringent and tonic wash." In a treatise written by Arthur upon this subject in 1845 he said, "If the membranes investing the roots of the teeth have been partially destroyed, and the teeth much loosened, nothing can be done to cause them to unite again and give to the teeth their original firmness." In this connection and in defense of the position taken—that there is much left to study and write about—I am going to make a statement which I am sure will provoke some discussion. While I believe that incipient cases of pyorrhea alveolaris can be successfully treated, in those cases in which the disease has advanced to what might be considered organic proportions, when the fibrous elements so essential to tooth-support are lost, under such circumstances I would qualify the opinion of Arthur, and say that as yet no treatment is available by which teeth thus affected can be restored to a normal condition. Doubtless the failure to successfully treat this condition is responsible for considerable dissatisfaction among the laity, and the scientist, teacher, or practitioner who is able to propound a method of treatment through which the shattered and broken-down fibers of the alveolodental membrane will regenerate, or cause new fibers to generate and bury their free extremities deeply into the cementum on one side, and into the bone of the alveolus upon the other (because this is what must take place), such a one will confer an everlasting favor upon the dental profession, and at the same time render a blessed boon to mankind.

Some threescore years ago a leading and wise feature of dental investigation and study was that of searching for a means whereby dental caries might be prevented. In commenting upon this subject, Fox said, "This delightful secret, although it is pretended to in the advertisements of every quack, we can only expect to acquire when the philosopher's stone and the grand panacea have been obtained." He further adds, "It is not in our power to alter the laws of nature, or change the natural constitution of man." We therefore take it that this writer considered one of the laws of nature to be that the teeth should decay, and that man was in a sense different from other animals in that his "natural constitution" provided for the possible degeneracy of the dental tissues.

It has always appeared to the writer that man should be as free from dental caries as other animals who inhabit the earth, and that the means by which this immunity should be brought about is absolutely under his control, in the matters of his habits, his environments, and his mode of living. The argument which is frequently used that the teeth, as well as all other parts of the animal economy, are subject to disease and decay, is not a forcible one, because dental decay is not necessarily a disease produced by any condition of the body marked by inharmonious action of one or more of the various organs, or by a general abnormal condition or structural change.

Perhaps the most forcible argument in favor of the possibility of bringing about a condition of immunity from dental caries in man is that all races and tribes are not affected in this way, and that animal-kind in general are practically immune. While systematic prophylaxis may assist to some extent, and perhaps to a considerable degree in the prevention of decay upon those surfaces of the teeth protected by an unbroken surface of enamel, it will fall far short of doing so in the sulci and developmental grooves, at which points coalescence is so frequently imperfect. It is not within the province of this paper to enter into a lengthy discussion of any one subject, but how much nearer have we arrived at a definite conclusion regarding the prevention of caries than when Fox wrote that the "delightful secret can only be expected when the philosopher's stone and the grand panacea have been obtained."

If we go back through the pages of dental literature, we find a condition of unrest and dissatisfaction occasioned by a diligent search for a satisfactory filling material. While the advances made in this particular have been considerable, and while the advent of porcelain appears to have brought us very much nearer the coveted goal, may it not be said that there exists today—all things considered—almost as much dissatisfaction in this regard as ever before. Is it not a question whether the earlier dentists, those who were inclined to be conscientious, were discontented to any greater extent with their mastic cements, their low-fusing metals, or their "granulated metal" mixed with mercury or gypsum, than are we today with our oxyphosphates, oxychlorids, gutta-percha, and amalgams? I know it will be argued that our interest in filling materials lies only in the general satisfaction which they give, and that the efforts to improve these should rest with the manufacturer. With this idea I cannot entirely agree. While it must be admitted that a large proportion of the credit for the improved filling materials of today belongs to the manufacturer, very much has been done by the profession itself, and further agitation regarding what is desired in this direction would be most welcome and appropriate.

And so we might proceed to enumerate very many features of our special work about which we might have a better understanding, some of which would be of the utmost practical value, and others which would indirectly through their special channels increase our knowledge and add to our usefulness. Considering all these things, let us not be satisfied with what we have done, or with what we are doing. Dentistry is a progressive science, and it is the duty of each one of us to assist in this progress, which can perhaps be as largely assisted through dental literature as in any other way. From the rapid progress made during the last half-century, a period rich in discovery and improvements, and one stimulated by a recognition scarcely expected, we might be inclined to suppose that little or nothing remains to be accomplished, although in reality the reverse is true. There are many things yet unexplored and even undiscovered, and these may be as rich in value and as important in successful practice as many now understood. With the possible exception of descriptive and surgical anatomy, and certain procedures that are purely mechanical, there is not a single branch of dental art that does not offer inducements for further research and study, and it was this thought which largely influenced the preparation of this paper.

FRACTURES OF THE MAXILLARY BONES, AND *RÉSUMÉ* OF FORTY-THREE CASES.

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(Read before the Providence Medical Society.)

AT the present time, with the rapid advance of medical and surgical science and our more complete knowledge of oral pathology, the sciences of dentistry and medicine are becoming more and more closely united, and it is not infrequent for the dentist to be called in consultation by the practitioner of medicine to determine the presence or absence of dental causes in relation to diseases of the mouth and jaws. From the more recent brilliant observations and investigations of prominent oral surgeons, it has been shown that the saliva is an index of faulty metabolism, that mouth-bacteria have a direct bearing upon pathological systemic conditions, and that quite often pyorrhea alveolaris has an important relation to uremic disturbances. The modern medical practitioner believes that obstinate trigeminal neuralgia, antral cases with obscure pain under the eye and outside the nose, and more especially fractured maxillæ, are often most successfully treated with the aid of the dental surgeon.

The results which we endeavor to obtain in the treatment of any fracture are complete reduction and adaptation of the parts; a firm, rapid union; and finally, restoration to normal function with no subsequent deformity. With few exceptions this last-named condition is of more importance in fractures of the maxillary bones than in those of any of the other bones of the skeleton, and the results which have been obtained in the treatment of this class of fractures by means of the interdental vulcanite or aluminum splints have led many surgeons to advise their patients to seek the service of a dental surgeon.

The older surgical method of wiring the fragments has been practically discarded, with the exception of very rare cases, for it was quite common for this mode of treatment to result in poor, slow union, only fair alignment of the teeth, and frequently abscess formation in the process of healing, the latter often terminating in necrosis of bone. Now, however, with a good impression of the teeth and a properly constructed and inserted interdental splint, we are assured of a firm and rapid union, perfect articulation of the teeth—and therefore good use of the teeth in mastication—symmetry of the face, and last but by no means least, absence of deformity or external scar upon the face, which was invariably the rule when wiring was resorted to. Formerly, in cases with little displacement the Barton bandage was used and the jaws kept closed, but at the present time, with the aluminum splint, some freedom of the movements of the mandible is possible, and the mastication of soft substances may be carried out.

A fracture of this kind is generally the result of a blow or fall, and the diagnosis presents little or no difficulty. A history of direct violence, abnormal mobility of the parts, loss of alignment of the teeth, increased ptyalism, drooling, swelling, and a penetrating, offensive odor, point to an injury to the bone, and this usually occurs at a point where teeth are missing, since this is the weakest part of the jaw. Fractures of the neck of the condyle are the only ones that present any difficulty, but with the assistance of the X ray and the cardinal symptom of deep-seated pain in front of the ear, this is easily disposed of. Direct violence on the symphysis is apt to cause fracture of the skull, and the prognosis is invariably favorable in a fracture which is a result of a blow directed elsewhere. In the maxilla partial fractures of the alveolar border are the most common, and in the mandible a simple fracture of the body of the bone is the condition commonly met with. The sequelæ of fractures of the maxillæ are abscesses, which may terminate in necrosis or a fistulous opening on the face. Fractures at the angle are very prone to be thus complicated.

The primary object of the treatment is complete reduction of the fragments and the preservation of the natural alignment of the teeth. Our cardinal principle in reduction is to preserve and replace all fragments and splinters, since the tendency to heal in these bones is stronger than in any others of the skeleton. If there is much swelling the ice-bag should be applied, and when this condition has subsided so that the jaws can be opened, an impression is taken of both maxilla and mandible in modeling composition. Into these impressions plaster of Paris is poured in order to obtain a cast of each jaw. To simplify the description, we will suppose that a mandible has been fractured between the bicuspid teeth. The cast of the mandible is sawed at the line of fracture and the parts articulated with the teeth of the cast of the maxilla. This gives us the patient's jaws as they were before the fracture. If there is only slight displacement we use an aluminum splint to jacket the teeth, swaged upon a metal die and counter-die of the mandible. The vulcanite splint is used when greater displacement is present and where muscular traction would dislodge an aluminum splint held entirely by cement.

If the vulcanite splint is to be used, the rubber is packed around the two casts, and it is vulcanized and finished as any rubber denture. The splint is then inserted; the parts will be held in apposition, and to further aid in accomplishing this purpose, a skull cap is adjusted. The mouth should be kept as clean as possible. A good union may be expected in from three to five weeks.

The only case that has not been described is that in which there are no teeth. The plates worn by such a patient can be vulcanized together and used in the same manner as a jacket splint. If the patient has no dentures, impressions are to be taken and the casts sawed as accurately as may be judged, taking into consideration the median line and the canine eminences.

RÉSUMÉ OF FORTY-THREE CASES.

The following summing up of forty-three cases gives a general idea of the jaw most frequently fractured; the seat and kind of fracture; the splint used; the most common cause and the duration of the treatment. Unless otherwise stated the patients were males and were treated at the Rhode Island Hospital.

In the cases here reported, single fractures of the maxillæ were found in 32 patients and double fractures occurred in 11, making a total of 54. Of these 54, 72 per cent. were found to be simple fractures, 24 per cent. compound, and 4 per cent. compound comminuted. Of the double fractures, 7 were simple and 4 compound. Three patients had both jaws broken, and in the entire list two deaths are recorded, one caused by delirium tremens and the other probably by a fracture at the base of the skull. In only one case was there a history of syphilis, and in this case a good, firm union resulted. In nine cases abscesses, due in most cases to delayed treatment, developed, two of these terminating in necrosis.

There was marked post-operative deformity in two patients. In one case there was considerable deformity in the malar and condyle regions, and in the other temporary loss of speech and a facial paralysis, which disappeared somewhat later.

Location and frequency. The location of the fractures and their frequency was as follows: Left mandible, 27; right, 18; median line, 3. Right maxilla, 4; left, 2.

Of the fractures of the maxilla the right alveolar process was fractured in three, the right palatal process in one, and the left alveolar process in two.

With the seat of fracture in the mandible, the location and the frequency were as follows:

(A) Incisor region, 20. Left, 9; right, 8; median line, 3.

(B) Angle, 6; ramus, 5. Left, 7; right, 4.

(C) Molar region, 10. Left, 6; right, 4.

(D) Bicuspid region, 6. Left, 4; right, 2.

(E) Neck of condyle, 1.

From this tabulation it will be seen that there were 8 fractures of the mandible to one of the maxilla.

Sex and age. In the series of 43 cases, 3 were women and 40 men. The eldest was fifty-three, the youngest twelve. The most common age was between twenty-three and thirty-five.

Age and frequency. Between the ages of twelve and twenty years, 4; twenty and thirty years, 18; thirty and forty years, 12; forty and fifty years, 6; fifty and fifty-three years, 3.

The appliance most commonly used was the vulcanite splint with the skull cap. The aluminum splint was used mostly in anterior fractures with little displacement and consequently with slight muscular traction, and a most excellent result was always obtained.

A comparative outline of appliances used is as follows: Vulcanite splint with skull cap, 23. Skull cap alone, 12. Aluminum splint, 4. Wiring of fragments, 2. Wiring advised but refused, 2.

A point worthy of note is that in the nine cases that terminated in abscess formation the skull cap alone was used in but three. This appliance worked very favorably in fractures of the ramus and angle, where the fragments could easily be held so that the teeth could occlude properly without the aid of a splint.

As to the duration of the treatment, ninety-three days was the longest time required, while twenty-three days was the shortest. The appliance was removed in the average patient on the forty-second day.

The most common cause was fist blows; 16 fractures were the result of this kind of violence, while 12 were caused by a fall from a height or against some object.

Some of the other more common causes were kicks by man or horse, pistol-shot, base-ball blow, and run-over accident. Twenty-five per cent. of the fractures were received while the patient was intoxicated.

EMPYEMA OF THE MAXILLARY ANTRUM: A STATISTICAL STUDY.

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(Read at the union meeting of the Seventh and Eighth District (N. Y.) Dental Societies, Rochester, N. Y., October 31, 1906.)

MY attention having been called to empyema of the antrum of Highmore, I became interested to know what dental literature contained on this subject, and to that end made search through the following journals: DENTAL COSMOS from January 1872 to August 1905; *Items of Interest* from January 1891 to August 1905; *International Dental Journal* from January 1889 to August 1905; *Dental Digest* from January 1895 to August 1905; *Western Dental Journal* from January 1892 to August 1905. I was greatly surprised to find that the number of cases reported was extremely meager, both in number and in detail, finding in all only sixty-eight cases containing notes sufficiently complete to be of value in this paper. This seems to me to be a very poor showing for such an important subject.

There has been, and probably always will be, a difference of opinion between the dentist and the physician regarding the etiology of empyema of the maxillary sinus. This is not surprising when we consider the fact that from the standpoint of the medical man, infections and inflammations of this cavity are, as a rule, found associated with pathological processes in the nasal cavity or in the accessory sinuses, to which the cause may be naturally attributed. On the other hand, the dentist and oral surgeon rarely see cases of this origin, their field being limited chiefly to cases resulting from pathological conditions about the teeth.

The attitude of the medical profession in this matter is contained in the following quotations: Henry Grandle, in "Diseases of the Nose and Throat," says, "It occurs (referring to empyema) either as a sequel to acute nasal catarrh or an influenza-rhinitis, or sometimes apparently primarily. In other less common instances the infection proceeds from diseased teeth." Again Knight, in his work upon the same subject, published in 1903, tells us that "It is still supposed that most of these cases may be traced to dental caries, but we have come to believe that a very large proportion owe their origin to catarrhal inflammations affecting the middle turbinate and its neighborhood." Finally Bosworth, while somewhat in doubt, reaches conclusions similar to those of the preceding author, for he says, "That carious teeth are a frequent cause of this disease cannot be questioned; that they are the most frequent is probably not easy to decide; from my own standpoint I should say not." From a dental standpoint we cannot accept this view as a fact, as the studies of Cryer and others have shown the high percentage of cases of dental origin.

TABLE 1.—*Probable Cause.*

Teeth	49 cases;	81.6 per cent.
All other causes	11 "	19.3 " "
Foreign body	3 cases.	
Rhinitis	3 "	
Syphilis	2 "	
Frontal sinus	1 case.	
Ethmoid cells	1 "	
Tumor	1 "	

Referring to this table (1) it will be seen that forty-nine cases or 81.6 per cent. were directly traceable to diseased conditions of the teeth. To this number should be added at least two of the cases of foreign bodies, inasmuch as they have reference to the presence of unerupted teeth in the cavity of the antrum.

In tabulating the frequency of occurrence of the disease on the two sides of the face, the fact develops that empyema is slightly more frequent upon the right side, in the relation of 52.8 per cent. to 45.9 per cent., and that it is rarely a bilateral disturbance.

TABLE 2.—*Location of Disease.*

Right side	25 cases;	52.8 per cent.
Left side	22 "	45.9 " "
Bilateral	1 case.	

Since the majority of cases are due to dental disease, which in itself evinces no preference for either side of the face, it seems plausible to trace it to the common custom of sleeping on the right side, a position which interferes with drainage of the right antrum, and which in the presence of a mild infection of the sinus would, by the retention of pathological secretions, cause an exacerbation of the existing disease.

TABLE 3.—*Occurrence in Relation to Sex.*

Male	30 cases.
Female	30 "
Not stated	8 "

From an examination of this table we find the occurrence equally divided, the relation of sex having little or no bearing upon the occurrence of empyema of the antrum.

Antral abscess may be looked for at any period of life, the extremes not excepted, as the following cases will show. Case 1, reported by Dr. Douglas, in which he found pus in the antrum in an infant of three months, and in case 2 Dr. Younger reports empyema of the antrum occurring in a woman of seventy-four years of age.

TABLE 4.—*Age of Patients Affected.*

Under 25 years	17 cases;	32.6 per cent.
25 to 50 years	30 "	57.6 " "
Over 50 years	5 "	9.8 " "

The figures obtained in Table 4 place the period of common occurrence between the ages of twenty-five and fifty years, the least number of cases occurring after the fiftieth year.

TABLE 5.—*Extent of Involvement.*

Antrum alone	57 cases;	83.5 per cent.
Antrum and nasal chamber	4 "	
Antrum and ethmoid cells	5 "	16.5 " "
Antrum and frontal sinuses	1 case.	
Antrum, frontal and ethmoid sinuses	1 "	

From a study of the above table it appears that only in a limited number of cases does the disease extend beyond the confines of the antrum; and of the cases in which at the time of treatment evidence of disease was found extending beyond the antral cavity, it is probable that the condition did not arise within that cavity, for referring back to Table 1, we find that 18.3 per cent. of the cases are reported as due to other causes, while 16.5 per cent. (Table 5) gave evidence of multiple involvement. Among the latter over 8 per cent. were not due to diseased teeth; consequently those cases showing multiple involvement—at least in the majority of cases—were of this group, and were not the outcome of infection originating in diseased teeth. These facts would seem to justify the following general rule: Antral infections originating in diseased teeth, which primarily involve the antrum, rarely pass beyond that cavity.

In cases of multiple infection the ethmoid cells are usually involved, probably on account of the intimate association of their outlets with the ostium maxillare in the hiatus semilunaris, and also because these cases are frequently the result of acute nasal catarrh or rhinitis, affecting simultaneously the outlets of the antrum, the ethmoid cells (anterior and middle), and the frontal sinus.

The complications of empyema are many, including more or less extensive necrosis, which was found in sixteen cases, or approximately one-fourth of all cases reported. Polypus was found in six cases, foreign body (wooden peg, teeth, drainage tube, etc.) in three cases; syphilis in two cases; benign tumor in one case. From this analysis it will be seen that the occurrence of complications is quite frequent, occurring in twenty-eight out of sixty-eight cases, or in 41 per cent. The possible existence of one of these several complications must always be borne in mind, as their presence in any case may retard or entirely resist cure, unless proper measures are adopted to meet the existing conditions.

Accuracy in diagnosis, not only with regard to the presence of pus, but also of the co-existence of any of the above complications, is of vital importance to insure intelligent treatment and a speedy and permanent cure.

TABLE 6.—*Teeth in Relation to Etiology.*

Central incisor	2	cases.		
Lateral incisor	2	"		
Canine	1	case.		
First bicuspid........	1	"		
Second bicuspid	10	cases.	28	per cent.
First molar	15	"	41.6	" "
Second molar	3	"		
Third molar	3	"		

An examination of Table 6 reveals the fact that the upper teeth, without exception, may be the cause of antral infection. This fact is at variance with the commonly accepted anatomical teaching in regard to the dental relations of this cavity. F. H. Gerrish, in a text-book of anatomy, states that "Along the lower angle [of the antrum] the roots of the first and second molars often project into the cavity." P. Watson Williams, in a treatise on "Diseases of the Upper Respiratory Tract," tells us that "The floor of the antrum is uneven from the projections of the sockets of the first and second molars." In Taylor's "Applied Anatomy," published in 1904, is found the following statement: "The floor corresponds to that part of the alveolar arch which carries the molar teeth. Its surface is usually uneven, and presents small conical elevations which are produced by the roots of the first and second molar teeth." Cunningham practically repeats this statement. Hughes in his "Practical Anatomy," describing the antrum, says, "The roots of the premolar and molar teeth frequently give rise to slight projections into it."

In Table 6 we have seen that in a study of less than one hundred cases clinical evidence tends to prove that not infrequently there may exist a close relationship of the antrum with the apices of the roots of any tooth in the maxilla. Ample corroborative evidence of this relation has been found in a recent study of the dried specimens. While in practice this fact should not be overlooked, as it may be of value in locating the origin of the trouble in intractable cases, it should be remembered that a large majority of antral empyemata of dental origin result from diseased first molars or second bicuspids. In this series 41.6 per cent. of the cases were traceable to infected first molars, while 28 per cent. were caused by diseased second bicuspids, making these two teeth responsible for nearly two-thirds of the total number of cases.

The time required to effect a cure in infections of the antrum of Highmore depends upon many factors, and varies greatly—the recorded extremes being from ten days, the minimum, to more than ten years, the maximum. Twenty-eight out of forty-seven cases, in which the duration of the disease was recorded, yielded to treatment within three months. In the more protracted cases there was usually present some secondary complication, most commonly necrosis of the bony walls or a polypoid degeneration of the mucous lining of the antrum. Necrosis was found in sixteen, or 23.05 per cent. of the cases, and polypi in six, or 8.8 per cent. of cases. Less frequently the existence of syphilis or the presence of malignant or benign tumors or foreign bodies was noted.

Delayed recovery from imperfect drainage—the result of the presence of bony septa within the antrum—must be considered, as these partitions, while never complete though frequently multiple, probably exist in the majority of antra.

We now come to the consideration of the treatment with particular reference to the methods of entering the antral cavity and the means of maintaining drainage, together with the drugs used in irrigation and medication.

Where best to enter the antrum for drainage and subsequent treatment is a question which remains undecided. There are four avenues through which the interior of this cavity may be reached. They are as follows: Through the alveolus of an extracted tooth, through an enlarged root-canal—the tooth remaining in place—through the canine fossa, and through the inferior nasal meatus.

Table 7.—*Avenues through which the Antral Cavity was Reached.*

Alveolus	42	cases;	66.6	per cent.
Canine fossa	11	“	17.4	“ “
Inferior meatus	6	“	9.5	“ “
Root-canal	3	“	4.7	“ “

Of these four methods the opening through the alveolar process is the most popular, having been used in exactly two-thirds of the cases in this series. The prevalent selection of this method probably results from the fact that, the teeth being the original offenders in a large proportion of the cases, the diseased tooth is extracted, thus permitting of easy access to the interior of the antrum, with little or no further manipulation. The canine fossa, which was used for drainage in 17.4 per cent. of the cases, presents the simplest method for the dentist, when extraction is not contemplated or required. The bony wall is extremely thin in this region, and with the aid of local anesthesia can be perforated very readily with a trephine or large bur.

Securing drainage through the nose by way of the inferior meatus seems only recently to have been looked upon with favor by the dental profession, and has so far been performed chiefly by the specialist. This operation, because of the ease and simplicity with which it can be performed, at the same time offering almost absolute protection from secondary infection and the entrance of foreign bodies, is sure to increase in favor, and should in time render the older and less cleanly methods obsolete. The claims of some operators that it is difficult to treat through this opening, and that the drainage is not sufficiently free, seem to me, after careful study of the reports of cases so treated, to be without foundation. Drainage through the root-canal of the offending tooth is of doubtful utility, and must be reserved for those cases in which the root-canals are unusually large and where the infection is mild, for the average root-canal is entirely too narrow to permit of any satisfactory treatment through it.

For the maintenance of drainage three methods are in use at the present time.

Table 8.—*Method of Continuing Drainage.*

Drainage tube	11	cases;	16.1	per cent.
Loose packing	19	“	27.9	“ “
Nothing used	38	“	55.9	“ “

In eleven cases some form of drainage tube was introduced, and was kept in place throughout the treatment. Simple gauze or cotton packing served to promote drainage in nineteen cases, this being removed during irrigation and medication. In the remaining thirty-eight cases nothing was used to keep the canal patulous or to prevent the ingress of foreign material, the operators having relied on frequent manipulation and irrigation to keep the opening from healing too soon. Of these three methods, the use of the gauze drain is by far the best, since its use is based upon surgical principles, and also because it efficiently excludes both bacteria and food particles, while allowing of free and continuous escape of pathological secretions. The use of a tube is both filthy and inefficient, since, as a rule, the end of the tube will project above the level of the floor of the antrum, thus defeating its own purpose. To use neither tube nor gauze is unsurgical in the extreme, and must in many instances be the cause of delayed cure through reinfection of the antral cavity from the mouth.

Among the drugs which have been used in the treatment of this disease in this series may be mentioned the following: Hydrogen dioxid, 23 cases; carbolic acid dil., 17; boric acid solutions, 13; normal saline solution, 8; iodoform, usually gauze, 7; tincture of iodin, phénol-sodique, each 5; silver nitrate, protargol, each 3; aromatic sulfuric acid, oil of cinnamon, and mercuric bichlorid, each 2; potassium permanganate, campho-phénique, zinc sulfate, creasote, and oil of cloves, each once. Besides these I might mention an almost infinite number of proprietary preparations that had been tried.

In studying the results obtained from the use of this array of drugs, it appears that in the absence of complications, and aided by efficient drainage, the most happy results have followed the application of an active antiseptic or germicide, such as hydrogen dioxid or dilute carbolic acid solutions followed by irrigation with boric acid or normal salt solution. The use of all caustic or irritant drugs is contra-indicated except under special circumstances.

SHALL WE ABANDON NITROUS OXID FOR ETHYL CHLORID OR SOMNOFORM?

By M. M. FRIEDLAND, D.D.S., New York, N. Y.

FOR the last few years the field of general anesthesia has been enriched by many discoveries, but in particular two agents for general anesthesia have been of late strongly advocated and recommended to the dental profession for the induction of a short general anesthesia. These agents are ethyl chlorid and somnoform.

The requirements of a perfect anesthetic should be (1) safety; (2) complete anesthesia; (3) no bad after-effect; (4) easy and quick action; (5) duration.

We all recognize that when placing a patient under any anesthetic there is always some danger involved which cannot be foreseen. Nitrous oxid answers all the demands except the fourth, as stated above. Statistics prove that since N_2O was discovered by the immortal Humphry Davy, it has claimed up to date forty-one victims, in all of whom it was directly or indirectly used to induce the anesthesia. As an illustration we can take the record of Greater New York. During the last ten years in New York two deaths occurred, one in November 1895, and the second in the early part of May 1905.

TWO FATALITIES UNDER NITROUS OXID.

First case. Mrs. T., forty-two years of age, died in the office of Dr. W. The woman had been suffering from four bad roots and consulted Dr. W., who advised their extraction. The patient was anesthetized with N_2O. The roots having been extracted, immediately after the operation Dr. W. noticed the absence of respiration, and he at once loosened her dress and resorted to artificial respiration. Dr. C. was called in and immediately administered one-twentieth grain of strychnin nitrate hypodermically; but all efforts were in vain and the patient died.

Second case. Occurred in the early part of May 1905, in the office of Dr. S. A servant girl, foreigner, age twenty-three, apparently in good health, came for the extraction of an upper molar. After making a superficial examination the doctor thought it safe to administer gas. The tooth having been extracted, he noticed that the patient turned abnormally pale. He immediately applied restoratives, and resorted to artificial respiration, but to no effect. The coroner diagnosed the case death as due to heart trouble.

CHARACTERISTICS OF NITROUS OXID ANESTHESIA.

Safety. We can assume that in Greater New York nitrous oxid is administered daily six hundred times, which will make yearly 219,000, in ten years 2,190,000; and within these ten years—1895 to 1905—two deaths have occurred from N_2O as I have above described. So that according to these figures it is safer to take N_2O than to ride in an automobile or cross any busy street in New York city. These facts cover fully our demand as to safety.

Absence of pain. If N_2O is properly administered we are sure that the operation is painless.

No bad after-effect. As soon as the patient recovers the N_2O is entirely eliminated, recovery is very rapid, nausea and depression are rare; while in using ethyl chlorid or somnoform nausea is frequent. These latter should not be given on a full stomach under any circumstances.

Easy and quick action. Here is where ethyl chlorid and somnoform are supreme. The action is so rapid that the patients are under the drug's influence before they realize what has occurred. I prefer somnoform to ethyl chlorid on account of the death record of the latter, which I shall discuss later.

Duration. On this point many suggestions have been made. An article published in the *New York Medical Journal,* November 1905, says, "Nitrous oxid narcosis can in most cases be continued 'smoothly,' with no cyanosis and with a fair degree of relaxation, even for an hour. A laparotomy may be thus performed if ether and chloroform are contra-indicated. To secure such narcosis it is best to use an apparatus that permits exhalation into the gas-bag and which has a valve for the admission of air. The bag should not be distended fully; after brief air-and-gas administration the air is turned off and the patient breathes N_2O and his own CO_2 at short intervals, and whenever there is any cyanosis a single breath of pure air is allowed."

As a rule, when air is administered in the proportion of about two inhalations of gas to one of air the anesthesia is prolonged, and the absence of cyanosis is obtained.

Of late, a new device has been put upon the market for prolongation of the anesthesia. It is made of soft rubber, in the shape of a nose, with a rubber holder around the head to keep it in position. After the patient is fully under the anesthetic, the nasal attachment is put on the nose while operating. It gives enough gas to keep the patient in a good stage, and he inhales enough air while the mouth is prized open. Nitrous oxid with oxygen combined has proved a great success. It was first introduced by Dr. E. Andrews of Chicago. It prolongs the anesthesia, and makes it one of the safest in the world, as no case of death has ever occurred where N_2O and oxygen have been used in combination.

At present, whenever an anesthesia of a long duration is employed on anemic or generally weak people, oxygen is used with ether or chloroform in every hospital. The longer the anesthesia, the more urgent is the call of the blood for oxygen. It is known that when an anesthetic is used the blood becomes more and more venous, for not getting enough supply of oxygen from the air by the irregular form of breathing, asphyxia is produced by the diminution of oxygen more than by the increased amount of carbon dioxid. In general, while breathing, the blood in the lungs takes oxygen from the air and gives forth carbon dioxid with the exhaling breath. A ten per cent. mixture of oxygen with N_2O is in almost all cases very successful.

Taking all these facts into consideration, we can safely prolong the anesthesia with N_2O as well as with ethyl chlorid or somnoform.

ETHYL CHLORID.

Ethyl chlorid as a general anesthetic has been in use since 1900, although it had been on the market before, but was used as a local anesthetic only. While using it as such, dental practitioners by chance found out that patients have been anesthetized generally by the local application to the gum. It has been highly recommended by the American and European surgeons as a quick, active, and safe anesthetic for minor operations of a short duration. The claim is made that it is as safe as N_2O, and has an advantage over N_2O in that the anesthesia is obtained quicker and is of a longer duration. It is true that the effect is quicker and the anesthesia is prolonged, but it cannot compete with nitrous oxid in the principal and most important question of safety. A paper read at the fifty-third annual session of the American Medical Association, by Dr. Martin W. Ware of New York, November 8, 1902, states the following: "As the field of ethyl chlorid is only for minor operations, it must be pitted against nitrous oxid. The latter has the greatest record statistically for safety, its death-rate being placed at 2 in 1,500,000. For ethyl chlorid, I am able thus far, conjointly with my own 1000 cases, to present you a record of 12,436, with but one *bona fide* proved death, forthwith to be narrated.

TWO FATALITIES UNDER ETHYL CHLORID.

First case. A day laborer, forty-one years of age, muscular, alcoholic. The patient had an extensive ulcer of the leg. A transplantation operation was contemplated. Kélène narcosis for two minutes; extensive excitation; more kélène injected on the mask after three minutes. The blood being dark, the mask was removed; cornea and pupil reflexes abolished; defensive motions with extremities; rigidity of the jaws; spasmodic breathing; cyanosis. Pulse was perceptible but not countable, owing to the rigidity of the muscles; then followed an intermission of the pulse, and death. The succession of events was instantaneous, the whole interval of time comprising three minutes. Five grams of ethyl chlorid were used. Artificial respiration was kept up one hour, camphorated oil injections were used, patient placed in the Trendelenburg position, cardiac massage, galvanism of the phrenics, all to no avail. Post-mortem: eccentric hypertrophy of the heart; fatty degeneration of the cardiac muscle, extensive arterio-sclerosis of the coronary arteries; sclerosis of the aorta in moderate degree; blood in the heart and veins of a cherry-red color, fluid, not coagulated (the blood recalls poisoning by coal gas); no ecchymosis in the pericardium or pleura; no edema of the lungs. The absence of ecchymosis is noteworthy, hence no asphyxia can be charged. Extensive arterio-sclerosis of the coronary arteries was assigned as the cause of death.

Second case. A female, fifty-five years of age, kypho-scoliotic, came for the extraction of lower molars to her dentist. She was at times subject to cardiac derangement; had within the year suffered from a fracture of the rib, and later from an attack of left hemiplegia. I had not seen her for one year until the message came that the patient was unconscious after a tooth-extraction. I found her unconscious, automatic reflexes, corneal reflex absent, pupils contracted, jaw hanging, tongue not retracted, but limp; respiration intermittent, at intervals of two to three seconds two or three respirations, and at times deep sighs; expiration very slight; then another interval, followed by the same type of respiration; pulse 84, regular; the heart-sounds clear; lungs free from disturbance; temperature 36.2° C.; color of the skin not blue, rather bright red cheeks; no odor emitted from the mouth, no vomiting; no incontinence. Flagellation and all else did not rouse her. Attempts at artificial respiration were of no avail; camphor and ether injections to the number of eight were ineffective."

The dentist's narrative reads thus: "The fear not unusual with a patient approaching the dentist's chair manifested itself in our patient. At 10 A.M., after drying the gums, moistening them with glycerin, and guarding against the unnecessary inhalation of ethyl chlorid by covering the middle and index finger with a napkin and surrounding the lower teeth to be extracted, I sprayed the ethyl chlorid at a distance of 35 cm. on the gums until they were blanched. Extraction required about twenty seconds, and two grams of ethyl chlorid were used. Following subsequent rinsing of the mouth, her head suddenly dropped, the jaw sank, the face became pale, and the eyes were dull and fixed. The pulse was weak. I exercised traction on the tongue, practiced artificial respiration, and provided for the access of fresh air. All this I kept up until 3 P.M. Until 10 o'clock at night this collapsed condition continued; the pulse gradually weakened and accelerated up to 110; the respirations were 24. At 2.30 the next morning death set in. This was no asphyxia, but a suspension of consciousness and then a paralysis of respiration, finally terminating in cardiac paralysis. After the use of ethyl chlorid narcosis promptly set in, and so quickly were the cerebral functions in abeyance that the cortical centers and medulla became paralyzed. After fourteen hours death supervened."

Dr. Ware in conclusion states: "As the patient had one year ago experienced an apoplectic stroke, perhaps due to embolism from the heart, it is possible that a recurrence of the attack may have been the cause of death, as ethyl chlorid is too quickly eliminated from the system; no matter what caused the death directly, the indirect cause was, after all, ethyl chlorid."

The mortality of ethyl chlorid Dr. Ware places, according to statistics, at 1 in 17,000 while that of N_2O, according to Dr. Hewitt, is 1 in 1,500,000.

Again we hear some alarming reports about ethyl chlorid from abroad. The *British Journal of Children's Diseases* for April 1905 calls attention in an editorial to the fact that at a recent meeting of the Society of Anesthetists several fatalities were reported during the administration of ethyl chlorid. Last June this same journal published a paper read by Mr. Caldecott before the Society for the Study of Diseases of Children on the use of ethyl chlorid as a general anesthetic, in which, after attention had been drawn to the many advantages of the drug and to the cases for which it was most suitable, it was very clearly laid down that the agent in question is a very powerful anesthetic, and should only—except under circumstances of extreme urgency—be administered to patients who have been properly prepared.

Since that time, however, ethyl chlorid has attained a very widespread popularity, and owing doubtless to the ease with which complete anesthesia may be induced by its use, there is considerable risk of its being employed in a haphazard fashion and in unsuitable cases. It is not suggested that any of the reported fatalities were due to either of these causes, but their occurrence certainly proves that its administration is not by any means free from danger to life. As suggested at the meeting of the Society of Anesthetists, there are several precautions which should be observed: (1) The patient should be prepared as for chloroform or ether; (2) care should be taken not to present at first too large a dose; (3) a prop should always be inserted between the teeth; (4) the patient should be allowed to rest for some time after administration, as faintness occasionally supervenes, especially when a large dose has been given; (5) the drug should not be sprayed directly upon the mask close to the patient's face.

There can be no doubt that the introduction of ethyl chlorid as a general anesthetic is a very important innovation, especially valuable in the case of children, and it would be a matter for regret if the drug were to fall into disrepute through accident caused by disregarding such dangers as must inevitably attend the administration of so powerful and rapid an anesthetic agent. Taking all these facts about ethyl chlorid into consideration, I think that we dental practitioners are not justified in placing the lives of our patients in jeopardy for such minor operations as extracting a tooth or even a dozen of teeth.

SOMNOFORM.

Somnoform is the discovery of Dr. Rolland, director of the Dental School of Bordeaux, France. It is a mixture that contains ethyl chlorid sixty per cent., methyl chlorid thirty-five per cent., ethyl bromid five per cent. The liquid has a strong odor, and is far from being pleasant. In some cases the first few inhalations produce a mild cough, due to the pungent odor. In somnoform there is no rule laid down as to the quantity, administration, and recovery. I have given 6 cc. and 7 cc.; about 3 to 5 cc. is the general dose. Concerning administration, one is often compelled to give more air than stated, as patients display uneasiness. The symptoms of the complete anesthesia are numerous. A symptom found in one person may be absent in another; as for instance, with some people the pupils become dilated while with others they are strongly contracted; some will snore mildly while others do not; some become flushed in the face, others retain their normal color. Relaxation of the muscles is more or less usual, although I have had cases where a complete rigidity of the muscles has been present during the entire duration of the anesthesia. Nevertheless the most reliable sign of the complete anesthesia is muscular relaxation, also the absence of the conjunctival reflex. The former I elicit by instructing the patient to have the fingers of both hands interlocked in front of the chest, and when anesthesia is complete the hands will relax and drop to the sides. Concerning conjunctival reflex, the best method is to separate the eyelids and blow in the eye, and when no reflex takes place as a rule the patient is fully anesthetized.

The anesthesia becomes deeper after removing the mask. As for rapidity of induction of a full anesthesia and its duration it is superior to N_2O. It takes from 20 to 35 seconds to bring the patient under a full narcosis. The duration is from 1 to 3 minutes, seldom longer; recovery as a rule is quick, but after-results, as nausea, headache, and depression, are far above the percentage as compared with N_2O.

I personally use somnoform in cases where I want quick action, on patients that are nervous and hesitating. They become anesthetized before they realize what has occurred, and have no time to raise a disturbance.

As a warning to those who use somnoform in graduated bottles I can state from observation that the drug is by no means as pure as that contained in the small, sealed tubes. As a matter of fact any mixture is apt to become quickly decomposed, and the reason I assign for the decomposition in the graduated bottles is that they are not as hermetically sealed as are the small tubes. From a logical point of view we should not be too much influenced by claims made by the manufacturers of every new drug or device.

In conclusion, although we have heard no death reports due to somnoform direct or indirect, yet, as it is in its embryonic stage, we must acquire a few years' experience before regarding it as equivalent in safety to N_2O, even though we must keep on administering N_2O with its cumbersome apparatus,—and see our patients wake up with a smile which is absent in somnoform cases.

NOTE.—Since the preparation of this paper, the *New York World*, in its issue for April 23, 1906, reports a case of death following the administration of somnoform. The patient, an over-trained athlete, was placed under the influence of the anesthetic mixture prior to the performance of a slight operation in the nasal passages. The patient seemed to have withstood the operation successfully, but suddenly collapsed as he was being lifted from the operating table. Notwithstanding the strenuous efforts of the attending physicians, the patient died in thirty minutes. A postmortem examination showed a marked hypertrophy of the heart walls.

CORRESPONDENCE.

A CASE OF "DENTINITIS."

To the Editor of the Dental Cosmos:

Sir,—About a month ago I inserted some six or seven gold fillings in the mouth of a man who is suffering from chronic diabetes, and is under treatment for this affection. None of the cavities reached beyond the dentin, nor did they seem to respond to thermal changes while they were being prepared. A few days after accomplishing the work, the patient presented himself complaining of extreme sensitivity about the necks of the teeth, particularly on drinking cold or hot liquids, in the molars that had been filled.

I attributed the sensitivity about the necks of the teeth to the removal of salivary calculi, and I touched them with a stick moistened in creasote; then dismissed the patient with the statement that it would probably wear off in a few days, and to take care not to expose the affected teeth to extreme thermal changes.

In the course of a week the patient appeared again, as the symptoms were, if anything, worse. The pain was constant, and while it seemed severe in some teeth that had not been filled, it had become excruciating in character when liquids would come in contact with certain fillings on the occlusal surfaces of the molars.

To satisfy the patient, and in the endeavor to actually relieve him, I removed some three fillings, inserted gutta-percha in their stead, and advised the use of a mouth-wash containing tincture of myrrh to be employed tepid; patient to report the next day.

The patient reports very slight relief and the case stands as in the beginning. Now, what I should like to ask the readers of the Dental Cosmos is, whether they have ever met with such a stubborn case of dentinitis (?), and what treatment should be followed for its cure or relief? Is the cause in this case the diabetes or the filling?

A. C. Betancourt.

Havana, Cuba, June 19, 1906.

FRACTURE OF THE MANDIBLE FROM GUNSHOT WOUND.

To the Editor of the Dental Cosmos:

Sir,—On October 10, 1905, Mr. H. and a friend were in the mountains bear-hunting. They separated and agreed to meet at a certain point up the canyon. Mr. H. arrived at the place first, and was walking around in the brush when his friend seeing the brush move and thinking it was the bear, raised his gun and fired—the gun was a 30-30 high-power Winchester rifle—the bullet striking Mr. H. just below the left ear, and cutting the ramus of the mandible completely off just above the angle, and splitting the condyle from the coronoid process. After passing through the mandible, the bullet struck the upper second molar, tearing it away together with the upper first molar and the upper second bicuspid, and very much loosening the first bicuspid, and making its exit through the cheek a little above and half an inch back of the left buccal commissure. None of the lower teeth were injured.

The friend wanting to be sure that the bear had been struck, shot at him again, this time shooting Mr. H. through the left arm above the elbow, breaking the bone and causing a very bad wound.

The patient was brought to town (about twenty-five miles) and placed in the hospital in the care of a physician, but as the latter could not properly reduce the mandibular fracture, I was called in on the 15th, five days after the accident. I found the face very badly swollen, and the wound giving off a very offensive odor. I thoroughly washed the parts with a good antiseptic solution, and placed Angle's fracture bands on the lower second bicuspid and upper second bicuspid on the right side, and on the upper canine and lower second bicuspid on the left side; the upper first bicuspid being very loose and the other teeth having been shot away on this side, it was impossible to secure anchorage at any other point. I then brought the mandible forward and upward into place, and wired the left side first, then the right side, bringing the mandible into perfect articulation with the maxilla. I left them in that position for forty days, when upon removing the bands I found a good union of the fractured parts. There was slight necrosis from the splintered bone which I removed from time to time, and in about two months the wound had entirely healed.

We could feed the patient satisfactorily through a tube placed in the mouth where the teeth were shot away. The mouth was washed out five or six times a day with a good antiseptic solution during the time the jaws remained wired together, which kept the wounded tissues in a very fair condition.

L. L. WHITSON, D.D.S.

EUGENE, OREGON.

PROCEEDINGS OF SOCIETIES.

MARYLAND STATE DENTAL ASSOCIATION.

Quarterly Clinic, December 1905.

THE regular quarterly clinic of the Maryland State Dental Association was held in the Royal Arcanum building, Baltimore, on Saturday, December 9, 1905.

The meeting was called to order at 8 o'clock by the president, Dr. A. C. Brewer, Baltimore, in the amphitheater of the Baltimore College of Dental Surgery.

Dr. C. M. Gingrich, chairman of the Business Committee, read letters from the following gentleman expressing their regret at not being able to accept the invitation to attend the meeting: Dr. C. N. Johnson, Chicago, Ill.; Dr. J. A. Libbey, Pittsburg, Pa.; Dr. L. C. Taylor, Hartford, Conn.; Dr. E. C. Kirk, Philadelphia, Pa.; Dr. William Jarvie, Brooklyn, N. Y.

The next order of business was the report on clinics, and discussion thereof.

CLINICS.

Dr. M. F. **FINLEY**, Washington, D. C. "Orthodontia."

Dr. Finley said: My idea is that the Jackson plan of regulating teeth is the simplest, the cleanest, and the best for the patient. The appliance when the pressure is to be changed is removed from the mouth, and every part of the mouth and the appliance can be thoroughly cleansed, in contradistinction to the majority of regulating appliances of other designs that are permanently anchored, and of which only the ligatures are removed. The system is less complicated, to my mind, than are the many others. I showed this afternoon in particular the appliance for jumping the bite, or compensating the bite. This case was one of protrusion of the maxilla as compared with the position of the mandible, and was corrected by simply making a rubber plate with a ridge in such a position that when the mandible approaches the maxilla, it will slide forward on the incline of the rubber plate. The appliance can be removed, as I have stated, for the thorough cleansing of the mouth. Most of the appliances of other systems for this purpose consist of metal bands cemented to the teeth, and provided with rubber bands for compensating the position of the teeth. In my discussion of Dr. Jackson's paper read at the Buffalo meeting of the National Dental Association (March 1906 COSMOS, p. 321), I made the assertion that one to be a thoroughly good orthodontist should be able to construct every part of his appliances himself; that where we depend upon appliances already constructed, we are too apt to misinterpret their application. Perhaps many do interpret them properly, but in those cases I have seen the operators did not. These appliances are easily modified to meet the changing conditions, and a new spring can be added in a very short space of time to meet the approaching condition as one proceeds with the work.

Discussion.

Dr. H. E. KELSEY, Baltimore. Such experience as I have had in the correction of irregularities has not led me to be very favorable to the Jackson system. While I believe that on the whole his system of correcting irregularities is not very good, there are, however, many cases in which it is perhaps the one to be preferred. Perhaps the best evidence that I can offer as to my belief that this system is useful in many cases, is the fact that I am now correcting a case in which I am using the Jackson crib. The advantages of which Dr. Finley speaks are apparent not only to those who have used this system, but also to those who have seen it used. It can be removed very readily from the mouth and cleansed, but the very fact that it can be removed so easily is I think, an objection, as the patient is more apt to remove it at his own pleasure than at the pleasure of the operator. Still in many cases it is an excellent method and has much to commend it.

Dr. J. H. LONDON, Washington. I have used the Jackson system in a number of cases, and I must say that I heartily approve of it. I have been using it five or six years, but did not fully comprehend its advantages, or realize its possibilities, until I read Dr. Jackson's book which has recently been published. It is very difficult to grasp all of its possibilities in a few glances, or in the few appliances that one may have made or seen made. I do not think that those who condemn the system, as many have, fully realize its possibilities.

Dr. B. HOLLY SMITH, Baltimore. While I do not believe that any person who attempts to practice orthodontia should limit himself exclusively to any one method, I do think that the application of some of the principles involved in what is known as the Jackson system, is helpful in nearly all of our cases of correction of irregularities. His clasp attachment—the wire attachment for molars and bicuspids—is very useful in the adjustment of substitutes for lost teeth. It seems to me that in the attempt to regulate or properly occlude teeth we should be careful not to bind ourselves to any one method. All of us are biased more or less by the advocacy of special methods. Why should we not be eclectic? It is perfectly right that a man should be the advocate of a method he has spent all his life to develop. He stands as a marked exemplar—a marked advocate of these appliances, and we are benefited by the results of his work. But it seems to me that any man practicing orthodontia should study all available methods, and fit their varying principles to each emergency as it arises.

Dr. F. E. WILLIAMS, Grand Rapids, Mich. I agree with the members who have spoken regarding our becoming familiar with all of the methods as nearly as possible, and should aim to derive the best we can from these methods; but we cannot so far as I have found use all methods and derive satisfactory results. If we can obtain such results from one particular method, and can obtain the required movements, and know and understand one system and what to expect from it, we had better adhere to that method, instead of learning more than one; for every time we repeat, we must necessarily begin at the beginning, while in holding to one method we can apply more time to it and learn more of its possibilities. In general, if there is any individual movement of the teeth in which we can combine the minor parts of other methods with our own and obtain results, I should say that we are justified in doing so; but if we can get the best results by one system, let us closely adhere to it, study and understand it, improve upon it if we may, and success will be assured to us.

Dr. C. J. GRIEVES, Baltimore. "Guarding the Cavo-incisal Edges of Porcelain Inlays with Gold."

Dr. Grieves said: My clinic dealt with the incisal edges, particularly the palato-incisal edges of large porcelain fillings, and the guarding of these edges with gold. Such cavities in the incisors are usually prepared with the cavity margins at an angle of ninety degrees to the incisal edge, so that the joint will be parallel to the long axis of the tooth. After such fillings have been inserted, it has been my experience that the pressure of soft food at this edge will pump out the cement, and consequently we always find the cement washed out to a greater depth at this joint than at any other in the filling. In a short time these walls being unsupported, with both the tooth and porcelain edges exposed to the full blow of the bite, check, resulting in the final loss of a piece of enamel or porcelain, leaving an unsightly crack. When such an accident occurs, and they have occurred in my practice in a short time after the operation, what shall we do? I have found nothing better to do, heretofore, than to remove the filling, and prepare another inlay, which means the destruction of more tooth-structure than any conservative man is willing to attempt. My method now is to divide the incisal edge at the cavo-incisal angle, cutting back into the palatal wall. I make the filling in the usual way and then grind off a bit of the porcelain extending into the step, leaving the cavity supported with sound dentin. The filling between the approximating teeth is supported by the aid of wedges, and with everything in readiness, the cavity is filled with a thin lining of cement, and a small piece of thin DeTrey's gold is laid in the palato-incisal angle, allowing it to extend beyond the cavity. The filling is covered with cement and is pushed into position, the wedges being left untouched until the cement sets, when the gold is burnished off. In this way two layers of cement are utilized, one on the tooth, and the other on the inlay, while the gold between them guards the edge in such a way as will prevent any pumping out of the cement from that joint. Furthermore, if the cement does pump out, the joint will not permit of daylight showing through it.

I have found it good practice to place in the palatal edge of inlays a piece of gold foil when cementing them to place. This is put in while the cement is soft, and with the cement on the inlay in the usual way, it is wedged into position, giving a filling made on this principle with as little cement as possible in the joint.

Discussion.

Dr. F. F. DREW, Baltimore. I would like to ask Dr. Grieves with regard to the burnishing—is that all he does? Is any grinding or polishing of the surface required afterward?

Dr. R. O. Sadler, Baltimore. I would like to ask the clinician if there is any discoloration caused by that piece of gold in the reflection through the enamel?

Dr. H. E. Kelsey, Baltimore. Dr. Grieves called the clinic a little matter, but I consider it a very important one, as it is a means of overcoming a difficulty encountered in every porcelain filling of this class. It is the very point that has caused me most trouble, in these incisal fillings, and his method of obviating the difficulty seems to me perfectly reasonable and logical.

Dr. Grieves (closing the discussion). In answer to Dr. Drew, I will say that the burnishing is all that I do, as DeTrey's gold becomes quite hard, which is all that is necessary.

The shadow from the gold to which Dr. Sadler referred is no more than the shadow from the cement. The gold is placed between two layers of cement, one next to the tooth and one next to the inlay, and is secreted in the palato-incisal angle, away from the labial side. It does not extend to the labial wall at all; it simply guards the palatal side.

Dr. Sykes. Do you find any decided advantage in grinding from the inlay over grinding from the enamel of the tooth? Would it make any difference whether we grind from one or the other?

Dr. Grieves. I have never ground from the tooth, feeling that I could do it better from the inlay, and do nothing to enlarge the cavity.

Dr. George E. Hardy, Baltimore. "Amalgam Filling with the Ivory Matrix."

Dr. Hardy said: My method is not a new one. I wanted to emphasize it to the profession, and bring to your attention the value of the Ivory matrix, with the latitude it gives the operator, and the advantages derived from its use in inserting plastic fillings, amalgam especially, although it may be used for gold and cement. The curve of the Ivory matrix band and the position of the punctures in the band are such that it restores the natural contour of the tooth as perfectly as any ready-made matrix I have ever seen. Dr. Register of Philadelphia demonstrated to us a few years ago his method of filling teeth with the copper matrix. I have never seen anything more perfect than that, but it is a little complicated, and takes more time to adjust than the Ivory matrix, which appeals to everyone for its facility and ease of adjustment, and the results which can be obtained with it. It is almost equal to Dr. Register's method of the copper matrix, but I prefer Ivory's as it is much more easily adjusted. I do not attempt any compound amalgam filling without the matrix, and I do not believe there are many operators who can insert a good amalgam filling without one. By its use one avoids the impact of amalgam against the gum and the consequences that necessarily follow.

Discussion.

Dr. H. F. Gorgas, Baltimore. I want to ask Dr. Hardy how he fills closely adjoining cavities, and also how he withdraws the matrix after completing the fillings. My experience is that I have torn out more fillings in withdrawing the matrix band than I have been able to insert successfully with it.

Dr. W. A. Mills, Baltimore. Some years ago I gave a clinic on contouring, filling not only the cavity, or cavities, with quick-setting amalgam, but the whole of the approximal space, and by the aid of the mirror carved the filling into shape. I never use a matrix of any kind.

Dr. Marshall Smith. If a thin piece of steel is passed between the matrix and the adjoining tooth and is allowed to remain during the operation, the removal of that piece of steel will afford sufficient room for the removal of the matrix without endangering the filling.

Dr. Hardy (closing the discussion). Dr. Marshall Smith has partly answered Dr. Gorgas as to the removal of the matrix. Of course, if you pull out the matrix heedlessly, you are very liable to drag with it the top of the filling. I find that the best plan consists in removing the retainer first, and bending the band backward. For instance if you are filling a distal cavity in a second bicuspid, bend the band back against the first molar; then take a pair of pliers and work it out gradually, keeping it forced back against the molar as it is withdrawn. Sometimes I take a pair of scissors and cut the band in two as near the tooth as I can and take the two pieces out laterally. In that way it can be removed without causing any strain on the filling. Again, I take a pellet of cotton, which I press on the filling while teasing the matrix out. Where I have two approximal fillings together, I usually put in one at a time, and wait until the amalgam has thoroughly set before inserting the other filling. But if time does not permit of this procedure being carried out, and the separation is ample, I put in a double matrix, and insert a Dickinson wedge, which is very much like a separator, although narrower at the top and broader at the neck, which forces the bands closely to the neck of the tooth. It separates the teeth to a certain extent and affords a firm surface against which to pack the amalgam. In such cases, when the wedge is removed the two bands fall together, and are not troublesome to remove.

Dr. W. G. Foster, Baltimore. "Administration of Somnoform."

Dr. Foster administered somnoform to three patients preparatory to the extraction of teeth.

Discussion.

Dr. S. C. Pennington, Baltimore. I hardly know what to say about somnoform, after witnessing its administraiion in only four cases. We all saw the results obtained this afternoon. Dr. Foster said at the time that he did not carry the patients as far under the influence of the anesthetic as he should. The patients all said that they knew what was going on, but felt no pain. One of the patients said that she had heard herself screaming, but that she had experienced no pain whatever. She thought herself in a railway collision. The effects of somnoform seem to be much more rapid but of shorter duration than those of nitrous oxid. I administer nitrous oxid for specialists for the removal of adenoids and tonsils, and they speak of it in commendatory terms. It gives them plenty of time, and as it has been administered so long and with such good results, they feel safer with it than they would with somnoform, and consequently are not willing that I should administer the latter to their patients.

Dr. W. A. Mills, Baltimore. I have witnessed many administrations of somnoform at the University of Maryland and other places, and have had some experience with the administration of it myself. I have also had a long experience with the administration of nitrous oxid, and have been very careful to observe the difference in the effects of these two general anesthetics. This difference can only be explained in a comparative way by saying that it is very much like the rapidity of effect between gunpowder and dynamite; one seeks the point of least resistance, while the other expresses itself suddenly in every direction. Somnoform, like the latter, acts so promptly in producing anesthesia that the effect upon the patient is like, as it were, striking him on the head with a club; while the former is gradual, passing through three stages before the patient becomes totally unconscious. I think somnoform is a good agent, but its effects do not last as long as those of nitrous oxid.

Dr. H. E. Kelsey, Baltimore. I have seen Dr. Foster administer somnoform very frequently and with great success, and I must say that so far as I have observed, the thorough and complete insensibility to pain is really very marked, and I think the agent compares very favorably with nitrous oxid. I saw it administered a great many times at Buffalo during the last meeting of the

National Dental Association, with almost uniformly good results.

Dr. Foster not being present to close the discussion, Dr. Pennington was called upon.

Dr. PENNINGTON. I do not know that I have anything further to say on this subject. This agent seems to act very nicely. It causes neither stertorous breathing nor muscular rigidity. While we used the mouth-prop in every case, the muscles are relaxed as soon as the patient is under the influence of the anesthetic, and it really seemed to work most beautifully. However, as I have seen this agent administered in only four cases, I do not feel capable of passing judgment on its merits.

Dr. H. M. SCHOOLEY, Washington. "A Method of Making Soldered Gold Crowns from One Piece of Metal."

After securing the root-measurement I cut the gold to the required length, so that when it is turned over and soldered, the band will exactly fit the root. Then I take a pair of shears and on one end of the band cut about twenty slits. Then I force these little sections over the end of the form which I have made to resemble somewhat the end of the tooth that is to be crowned. Take this band, which now roughly resembles a crown, place it on the root in the mouth, and trim approximately to the right length so that when the patient closes the mouth the occluding tooth will force itself into the soft end constituted by the sections lying one against the other. This gives a perfect articulation in most cases, and, as the slits readily yield, they can be bent until a perfect articulation is secured. The flux is then put on the outside of the articulating end of the crown and the solder on the inside; the crown is held over the flame so that when the solder melts a good backing of solder is obtained, which will permit of the crown being ground to suit the articulation. I claim for this method simply that we can secure a good fit of the root with the band, because we can see what we are doing. I also claim that by allowing the patient to force the teeth into this soft end we get a better occlusion than when the crown is made in the ordinary way. This is simply a little novelty that has proved quite helpful to me.

Discussion.

A MEMBER. About a year ago Dr. Schooley called my attention to this scheme, and I have since followed it to a great extent with exceedingly gratifying results, especially with regard to occlusion of the teeth. I do think that a good occlusion can be secured by that method, because the gold being soft the patient closes the teeth naturally upon it, and every strip is forced into the proper place. When it is soldered it can be polished smooth, when practically a solid piece of metal will be the result. It is an easier method than the one requiring the casting of the die and the swaging of the cusp.

The reading of the paper of the evening was now in order, and Dr. I. N. BROOMELL, Philadelphia, Pa., accordingly read a paper entitled "A Plea for Continued Effort in the Field of Dental Literature."

[This paper is published in full at page 824 of the present issue of the COSMOS.]

Discussion.

Dr. B. HOLLY SMITH, Baltimore. I would like to thank Dr. Broomell for his paper, with its words of encouragement to some of us who are yet unknown as writers.

If the Maryland State Dental Association in conjunction with the District of Columbia Dental Society really wants to do some good work, it seems to me it could not do better than employ with fair compensation one of its members, under instruction in some institution like the Johns Hopkins University, to unravel and make plain some of these mysteries. I think there are young men in its membership who would be glad to undertake the careful study of some of the very many problems that still remain unsolved.

Dr. W. A. **Mills**, Baltimore. The trouble with most of us is that we are too busy making dollars to read dental journals, much less write for them. I have made it a point through all my professional life to try to do something for the benefit of my profession, and to help in raising its standard all along the line, and in trying to do that I have worked with hands, heart, and brains, adopting from the beginning the motto of the DENTAL COSMOS, "Observe, compare, reflect, record," and I have added, "publish." Whether my labors have been a success or otherwise, time alone will prove. However, the consciousness still remains that I tried to do my duty as I saw it.

Dr. M. F. **Finley**, Washington. I have enjoyed a great many of the essayist's papers, and I especially enjoyed this one, because it is an encouragement, as Dr. Smith says, to those of us who have never attempted to do so before, to give our thoughts upon the subjects that are still unsettled, and which are presented to us every day in our practice, to those who are trying to fathom some of these deep secrets that have so long been hidden. I think Dr. Holly Smith made a strong point in suggesting that societies employ some one of their number to carry on scientific work, and be relieved of the necessity of earning their daily bread in the actual application of the science of dentistry. I think this will be the successful way of solving these problems, instead of allowing earnest men to overwork themselves conducting investigations to the detriment of their health and practice.

Dr. H. E. **Kelsey**, Baltimore. I think Dr. Broomell touched in the outset on the very basis of the whole matter, when he spoke of the question that has often been raised as to whether we should be permitted to widen our scope of research. I think that, above everything else, is the secret of the whole matter. If we confine ourselves strictly to what are known as practical points, we will remain very much as we are today. We have men who have called themselves practical men, very much ahead of their time, who have improved methods, materials, etc., in a thoroughly scientific way, and we all acknowledge the good work they have done; but what we want in the dental profession, if we want to take the place which we are constantly expressing the wish to take, is research men. We have such men as Miller of Berlin and some others, but not every man can do what Miller has done, because he has gone into the profession in a way that few of us have. He has prepared himself, spent years in the study of work allied to our specialty. He has gone into other fields to see if he could find there things that would assist us in our work. The idea that Dr. Holly Smith advocates of financially assisting competent and intellectually equipped men to carry on research work is an excellent suggestion, and we should combine our efforts to support such a scheme. It is only through scientific research that we may be eventually enabled to answer the questions which Dr. Broomell has propounded in his paper. We cannot all undertake research work, but we can encourage and support men who are fitted to do it.

I fully agree with Dr. Broomell that there are a great many points in the so-called practical phase of the profession that need further development. We have failed, as he says, to discover an ideal filling material—one which we shall be able to insert in a plastic form, having as good or better appearance than anything we have now, and which shall be permanent.

He spoke of the two classes of men who read dental literature; one willing to read voluminous articles in say eight or ten journals—from which they endeavor to cull the few new points contained; the other class, the one who wants its literature in a condensed form. No man is capable of condensing ideas other than his own. His own paper is the best argument in favor of condensed information. It is a short article, to the point, in which he has given his ideas, and taken very little time to do it. It would be well for every man to emulate his example, for then we would not have so many journals claiming our attention every month. I think we should reduce the number of journals to one. Let the dental profession support that journal, and when a man has an idea, or thinks he has one, let him publish it in that one journal where everybody will see it.

Dr. C. J. GRIEVES. I feel that Dr. Broomell's paper is entirely educational in character, that it is a plea for postgraduate work, and that it deals with educational ideals entirely. I heard a professor in one of our medical colleges say that the medical school of today produced two sorts of physicians, one being the physician who is a good all-round practitioner, and the other the medical philosopher who is the one to do postgraduate work, research work, and whose ideas will be applied after they have been thoroughly tested in the laboratory by the practitioners. And so I take it that Dr. Broomell has made a plea for more laboratory work, and I think he is one of the highest types of the research man. And that work cannot be done by dentists as dentists go. A man cannot stand on his feet all day long at the dental chair, as did Chapin A. Harris, and then write far into the night, in these days. There must be certain special men, as Dr. B. Holly Smith says, to do this work, and here we are at a great disadvantage as compared with the medical profession. A man in the field of medical research can dig and delve and perhaps discover some method of preventing disease, some type of auto-intoxication, for instance, and he will have not only the support of his profession, but the plaudits of the laity for having saved many lives. Now that same amount of time spent in dental research would mean little or nothing in so far as public recognition is concerned; teeth are not taken seriously by the laity; dental diseases rarely prove fatal, and such dental investigation would be known to only a few. At a recent meeting of the Dental Society of the State of New York our good friend Dr. Jarvie offered one thousand dollars for the best essay to be presented before that society, and that action should prove a stimulus to original research work. Personally, I do not believe that research work can ever be done by the rank and file. The men who are to undertake research work should be specially prepared, and under such circumstances it would be well, as Dr. Smith suggests, for us to select those best fitted and give them our financial support. It is a hopeful sign that laboratory work is now more frequent among us, as we all want that this work should be done within our profession, so that we may not have to look for results outside of it. There are so many collateral sciences in dentistry that it would take a multi-minded man indeed to master all of them. Our literature will be clearer when literary work shall follow the work in the laboratory. The literary work of the future will be composed largely of reports of results which the laboratory has conclusively proved. Somebody has said that the clinical experience is notably defective, but only clinical experience confirmed by the laboratory is of true value; even that, as Dr. Smith says, has changed frequently. As we have men in the profession working along these lines the signs are hopeful. We will have to depend on the investigations of the small cultured body of men, and it will be our duty to apply their ideas and credit and honor them for what they have done.

Dr. MARSHALL SMITH, Baltimore. Dentists do not as a rule deal with the large sums of money required to establish expensive institutions in which to conduct research work. The Johns Hopkins University Medical School with an endowment of millions of dollars does not seem to accomplish much in research work. It is slow work, it is expensive, and I think what we must do first is to educate the public to a fuller appreciation of the need of dental research work.

If we do the best we can, we will likely find some philanthropist willing to endow an institution in which to carry on this line of work. I think that this is practically our only hope, and I believe that we could accomplish results if we all did our best.

Dr. W. E. DIEFFENDERFER, Washington. I want to emphasize what Drs. Grieves and Smith have said, as it is just along the line of thought which I have followed. We admit the charge that we are not literary men, and I think it is for the reason that operations in dentistry are so varied. The dentist is to some extent a surgeon, physician, artist, chemist, and metallurgist; he is obliged to work with so many different materials each having different properties, and while we are familiar with most of these through continuous use, yet we have not the time required to investigate their different characteristics in addition to our professional duties. We cannot do it unless we have the constitution of a Hayden or a Harris, or of those who worked well into the night; or unless we are better compensated and have less hours of actual dental work. But we should not be discouraged. I think dentistry as a whole has rendered valuable services to humanity. Compare the work that is done today with that done in former years. Every nation admits that America is far ahead of any other country in the world in so far as dentistry is concerned, and at the clinic today I saw evidences of improvement in mechanical devices in our work, which in consequence is now more perfect than in former years. If we can so educate the public as to result in our having less hours of actual work and receiving more remuneration, many of us could spend more time in the furtherance of those branches of dentistry which have been so neglected.

Dr. BROOMELL (closing the discussion). I am very much gratified to think that the paper has brought out such a liberal discussion. In the first place I do not wish it to be understood that the paper is intended to be pessimistic in character; it is as a matter of fact the opposite to that. We have done wonders in the way of research in the past. Perhaps the title of the paper is somewhat deceptive; if I had selected the word "publicity" perhaps it would have been better. It is not my idea that we should spend our time in reading or writing lengthy articles on any subject. I think in the reports of the clinicians we have had tonight a very good example of what we should endeavor to accomplish. While these individually may not amount to much, if the results be combined and the reports of these clinics published—not necessarily in a literary way, but simply made public—then we will have done something for the profession.

The question of a post-graduate school has been mentioned. I am surprised to hear Dr. Marshall Smith say that he thinks very little has been accomplished at the Johns Hopkins University. My impression was that all good things in the medical line had originated in that institution; at least it is the opinion we have of that school in Philadelphia. In this connection I would like to say that there is an effort being made toward making use of the fund of the Evans estate for the establishment of a post-graduate school in dentistry. If that fund can be utilized in that way, we will thereby profit very largely. However, on the other hand, if it is given to an individual school, or if a new school is established—which of course is unnecessary—the fund will in a sense be wasted. But if we can interest the city authorities who now have control of the fund to establish a post-graduate school in dentistry, a school in which such subjects, not necessarily deep ones, but subjects which require considerable effort and time, may be taken up, I believe that the fund will then do considerable good.

Dr. MARSHALL SMITH. I would just like to offer a word of explanation. I think, of course, that the Johns Hopkins University Medical School is one of the best of its kind in the world, and I do not know one that is more successful in research work. What I mean by that remark is that research work advances so slowly that while as a matter of fact they may be making progress, apparently they seem to be accomplishing but little.

Dr. GINGRICH. I move that a rising vote of thanks be given Dr. Broomell for his presence with us tonight, and for the admirable paper he has presented.

The motion was carried, and the meeting adjourned.

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Thirty-seventh Annual Union Convention.

(Continued from page 767.)

TUESDAY—*Evening Session.*

THE meeting was called to order at 8.30 o'clock Tuesday evening by the president, Dr. Bachman.

The first order of business for the evening was the reading of a paper by Dr. FRANCIS ASHLEY FAUGHT, Philadelphia, Pa., on "Empyema of the Maxillary Antrum: A Statistical Study."

Dr. Faught not being present, the paper was read by the secretary, Dr. C. W. La Salle.

[This paper is published in full at page 831 of the present issue of the DENTAL COSMOS.]

Discussion.

JOHN O. ROE, M.D., Rochester, N. Y. The dental profession is, and should properly be regarded, a branch of the medical profession. The dentist and the physician have much in common which they may profitably study together—especially in matters pertaining to diseases of the upper air-passages and diseases of the jaws and teeth, and their interdependent relations. The proper development of the teeth and jaws depends so much on the normal condition of the nose and naso-pharynx that every dentist should be more or less of a physician, in order that he may be able to detect the diseases of these parts, which often affect the jaws and teeth; and he should also be able to recognize abnormal conditions of the general system that have a detrimental effect on, and interfere with the proper preservation of the teeth. The physician in turn should be more or less of a dentist so that he may be able to detect pathological conditions of the teeth and jaws which may cause derangements in the neighboring parts or reflected nerve disturbances in distant organs. It is for these reasons that members of the medical and dental departments of medicine should come together oftener, and discuss those topics in which they both are so much interested.

Dr. Faught in his excellent paper complains of the meager number of cases of diseases of the antrum recorded in dental literature. It is quite natural that this should be so, for the reason that only those patients who have antrum trouble associated with diseased teeth consult the dentist; while those patients having antral disease associated with diseases of the nose, or accompanied by a discharge from the nose, consult the rhinologist. Therefore, it is not surprising, as Dr. Faught observes, that nearly all cases of empyema of the antrum coming under the observation of the dentist are found to be due to diseased teeth. Dr. Faught also observes that while empyema of the antrum occurs with about equal frequency on the two sides of the face, it does, as a matter of fact, occur a little more frequently on the right side; this he attributes to the fact that people sleep usually on the right side, thus interfering with the free drainage of the right cavity. This fact naturally leads us to infer that the cause of the trouble in these cases is in the nose, because sleeping on the right side would have no influence whatever if the disease were due to the teeth, as the drainage of the antrum is entirely through the nose. In the association of diseases of the antrum with diseases of the other accessory sinuses, Dr. Faught naturally concludes that the dentist should not be expected to diagnosticate diseases of the antrum that arise from diseases of the other sinuses. I also quite agree with him that empyema of the antrum is not peculiar to either sex; that it occurs most frequently between the ages of twenty-five and fifty years; that antral infections arising from diseases of the teeth rarely pass beyond that cavity; and that diseases of the second bicuspid and of the first molar most frequently cause disturbance in the antrum, because these teeth very often project into the floor of the antrum, so that when diseased they easily cause antral disturbance. This latter condition is very often overlooked; and I quite agree with Hajek that it explains the frequent infection of the antrum by the teeth. In the normal jaw between the alveolar process and the bony wall of the antrum there is a layer of spongy bone, in which the roots of the teeth are embedded. If this be absent the teeth quite naturally project into the floor of the antrum, and in many cases are covered only by the muco-periosteum lining the cavity. Consequently, diseases of these teeth very readily infect the antrum.

As Dr. Faught in his paper has discussed the dental aspect of the subject, I will say a few words upon it from the rhinological point of view.

Until quite recently it was believed that empyema of the antrum arose more often from diseased teeth than from any other cause, but with the better knowledge of nasal and accessory sinus diseases it is the consensus of opinion at the present time that it is more frequently of nasal than of dental origin. And also, as Zuckerkandl and Dmochowski believe, it is quite possible that empyema of the antrum may be the cause of the tooth-affection, because a portion of the nerves and vessels supplying a number of teeth are directly connected with the soft parts of the antrum and the maxilla.

Empyema of the antrum may be primary or secondary. It may follow acute inflammation, or develop as a latent affection secondary to some other diseased condition. Killian and Fränkel believe that a great many, in fact the majority, of these cases are primary, and are caused by direct infection during acute diseases, such as influenza, measles, scarlet fever, smallpox, diphtheria, and erysipelas. We all remember the large number of cases of accessory sinus diseases—and particularly empyema of the antrum—that followed the first epidemic of grippe a few years ago. Previously, and before the appearance of Ziem's articles in 1888 and 1889, very few such cases were reported, and diseases of the accessory sinuses were quite imperfectly understood. But the large increase in the number of cases of diseases of the accessory sinus and the appearance of Ziem's articles served as a great impetus to the study of these affections, and many cases were recognized that had previously been overlooked.

When secondary to other disease conditions of the nasal cavity, empyema of the antrum is most frequently associated with ethmoid disease and nasal polypi, the latter obstructing the natural ostia. In disease of the frontal sinus the infection frequently finds its way into the antrum through the infundibulum. This condition I have observed in a large number of cases. In a case I have recently had, on extracting a diseased tooth—the supposed cause of the antrum trouble—I discovered, on opening the antrum through the tooth-socket, that the pus in the antrum had found its way there from the frontal sinus.

We also have many cases resulting from traumatism due to the use of the nasal douche, or to plugging the nose in cases of hemorrhage; and I am sorry to say that the injudicious use of the galvanic cautery in the nose is occasionally responsible for disease of the antrum. Foreign substances also find their way into the antrum. I saw a case reported a short time ago, in which a dentist in treating a diseased tooth crowded into the cavity nearly every day a cotton dressing, and at each subsequent visit the cotton would be missing; but, supposing that the cotton had dropped out, the dentist would place another pledget of it in the tooth. After a time there was a fetid discharge from the antrum, and, when opened to treat the diseased condition, it was found that the antrum was packed full of cotton.

It must be remembered, however, that from whatever cause the antrum may become diseased, it is always due to an infection; although this infection be not confined to a single micro-organism, nor to a single group. Stanculenau and Baup have divided the micro-organisms causing suppuration of the antrum into two groups: First, those of nasal origin, which are aerobic; that is, they thrive in the presence of oxygen and produce pus that is not fetid. They are mainly the pneumococci, streptococci, staphylococci, diplococcus, and lanceolatus. Second, those of dental origin, which are anaerobic; that is, they thrive without oxygen and produce fetid pus. These are the bacillus ramosus, bacillus petringens, bacillus thetoides, and staphylococcus parvules. These micro-organisms are the ones mainly found in dental caries, and are the cause of the fetid and foul odors that arise from diseased teeth. They are also the cause of the disease when the discharge from the antrum or from the other accessory sinuses is fetid. Thus it is readily seen that pyogenic bacteria of some kind must find their way into the antrum in order to produce empyema. We may have accumulations of mucus in the antrum in large quantities which we term mucocele, but unless it becomes infected with pyogenic bacteria, no empyema will result.

With regard to the relative frequency of suppuration of the antrum: Chiari found 45 cases among 2280 patients, about two per cent of people in general. This percentage, however, is doubtless too small, for the reason that many cases go undetected. This is clearly shown by the dead-house reports. Hark found 116 cases of sinusitis in 400 cadavers; Fränkel, 63 out of 116; Lapelle and Martin, 70 in 200, and Kiser found 88 in 195 cadavers. Of course, there must be taken into consideration the fact that in many of these cases the antrum may have become infected during the last illness of the patient, so that we do not know whether all these cases had gone undetected through life.

The diagnosis of diseases of the antrum, which in many cases is very simple, is in many others very difficult, owing to the complications and obscurity of the disease. If we find a purulent discharge from the nose, and at the same time a badly diseased tooth and a sensitive condition of the face, or neuralgia on that side, we naturally conclude that we have a diseased antrum associated with a diseased tooth. In a great many cases, however, we may have empyema of the antrum when the teeth are perfectly sound, with no large amount of pus escaping from the nose, and with no other symptoms than an occasional discharge of a small amount of pus, mainly in the morning, from one side of the nose, with perhaps an intermittent cacosmia, which may come from any of the different accessory sinuses.

In many cases of diseases of the antrum there is some sensitiveness of the maxilla or malar bone to external pressure. This is easily determined by running the finger along under the upper lip over the canine eminence. If we find tenderness on the suspected side and none on the other, while exerting the same amount of pressure, we may infer that the antrum is diseased.

This diagnosis must of course be confirmed by other evidences, such as the finding of pus in the nose escaping through the ostium maxillare, the transillumination of the antrum, or the direct exploration of the cavity. The next in order of simplicity is the posture test. This consists in first cleaning the nose of all discharge; then, if by inclining the head well over to the opposite side pus should appear just under the middle turbinate, it is positive evidence of disease of the antrum. The tuning-fork is often of service in these cases, as it is much more distinctly perceived by the patient when placed against the upper teeth on the side of the sound antrum, than when against one filled with pus. The method of diagnosis by transillumination so much in use is not only not infallible, but is often misleading. I have seen quite a large number of cases in which the antrum was found to be full of pus that gave no umbra at all; and I have seen other cases where there was no shadow at all on the suspected side although the antrum was found full of pus. These apparent discrepancies are accounted for by the great variation in the thickness of the bones and of the size and shape of the antrum in different cases, which is clearly shown by the illustrations in Zuckerkandl's atlas; and also by the skulls that I show you here, in which a section has been made of the anterior wall of all the different antra. It is interesting to observe the different shapes, sizes, and positions of the latter. Two of the antra also show the teeth projecting through the floor, owing to the absence of the layer of spongy bone already described. It is also in this connection interesting to note the great variation in the frontal sinuses, which have been opened for the purpose of ready examination. They vary just as much in size, shape, and position as the maxillary sinuses. The same variations are likewise found in the ethmoid and sphenoid region.

When the case is still obscure and the above-mentioned simple methods have failed to furnish positive proof of the presence of disease of the antrum (although by the process of exclusion we may be quite sure of its existence, on account of the absence or presence of co-existing disease in other sinuses) it becomes necessary to explore the antrum in order to determine both the presence and extent of the disease. The antrum may be entered through the inferior meatus, through the canine fossa, or through the alveolus of a diseased tooth after extraction. This method of direct exploration is in some cases the only available one by which a positive diagnosis can be made, and which is simply a prelude to the proper treatment by enlarging the opening, as the case may require. The simplest and easiest of these methods is that of opening through the tooth-socket; the next is that of puncturing the naso-antral wall well up under the lower turbinate with a curved trocar, and it is only in rare cases where the cavity is filled with polypi, and where only a scanty amount of pus exists, that the diagnosis is left in doubt.

In the treatment of antral diseases the three routes already mentioned, which are the avenues usually followed for reaching and treating the diseased cavity, will be in most cases quite adequate. The maxillar route, however, should be selected in those cases only in which a carious tooth has been the cause of the empyema. There is, however, another method, called the Caldwell-Luc operation, which is a combination of the opening through the canine fossa and through the naso-antral wall, whereby free access to the entire cavity can be readily gained from both directions. This method has the advantage of affording the freest drainage, and the greatest facility for treating the diseased cavity. In very obstinate cases, in which we fail to effect a cure by these methods, the radical method of Jansen, which consists in obliterating the cavity by the removal of the entire anterior wall of the antrum, is sometimes necessary. This operation I have performed in several cases with entire success. In this case we must also denude the entire cavity of its mucous membrane, so that it may eventually become filled with granulation tissue.

Dr. Faught has mentioned in his paper the ease with which the cavity can be entered through the nasal wall. In most cases this is quite true, but in some cases it will be found to be somewhat difficult, owing to the thickness of the bone and the position of the cavity. There is one point that should be taken into consideration in this operation, which is rarely mentioned by writers on this subject, namely, the height of the floor of the antrum as compared with that of the floor of the nasal cavity. In many cases it will be observed that the floor of the antrum is below the floor of the nasal chamber. Such conditions prevailing, an opening from the nose into this cavity by which discharges from the nasal chamber may drain into this cavity, would form a *cul-de-sac* for their reception and retention; whereas, if the floor of the antrum is above the floor of the nasal chamber so that drainage from the antrum may pass into the nose, this operation is then highly desirable, and is perhaps the best in all these cases.

In regard to the treatment of those cases in which there are septa in the floor of the cavity, which Dr. Faught has mentioned as an important hindrance to free drainage, and which these skulls admirably demonstrate—for they show septa in several of the cavities—it is highly important that these septa be removed, as they form pockets for the retention of pus. On opening the cavity through a tooth-socket, after the removal of the diseased tooth, the opening would naturally extend into but one of these apartments. After thus opening the antrum I first explore for these septa by means of a curved-hooked instrument, which I pass into the antrum and draw back along the floor. If septa are present it will catch over them, thus indicating their presence. In that case, by taking out of a V-shaped portion the inner part of the opening is made sufficiently wide to include the entire floor of the antrum, which thereby cuts through all the septa and gives perfect drainage. All septa that may interfere with thorough treatment should likewise be removed when the cavity is opened through the canine fossa or the inferior meatus. This can be done with the rongeur forceps, bur, or drill according to the shape of the cavity and position of the septa.

In the treatment of all these cases it should be observed that from whatever route we gain access to the antrum for treatment, the opening should be very large and free, sufficient not only for perfect drainage, but also for thorough exploration, inspection, or curettement of the cavity, when filled with degenerate or myxomatous tissue.

Dr. Faught has stated that the recorded limits of treatment vary from ten days to ten years. This is quite true if treated according to the old accepted methods of washing and draining. Acute cases usually recover spontaneously, for it is not uncommon for the mucous membrane of the antrum to be actually inflamed during a severe coryza and especially when of an infectious nature, like so-called grippe. Some of these cases, although they may have become more or less chronic in character, can be speedily cured by the use of the ordinary antiseptic washes and free drainage, if instituted in time—that is, before the degeneration of the mucous membrane or myxomatous growths have taken place. Many cases are recorded in which the antrum has been washed out through the ostium maxillare, or natural opening, and I have succeeded myself in doing so in a number of cases; but there are many in which the position of the uncinate process renders this impossible.

When the disease does not yield in a reasonable length of time to these mild means, radical measures should be instituted. One who has seen the antrum filled with polypi and degenerated tissue cannot fail to be impressed with the absurdity of continuing the old-time treatment by washing and draining through an alveolar tube—a method, in chronic cases, fast becoming obsolete. The relative inefficiency of the old method is quite apparent when it is seen that by a radical operation—the removal of the naso-antral wall, or by the Caldwell-Luc or Jansen's operation under general anesthesia—the disease can be permanently cured in a few weeks. Should the antral disease be associated with a chronic frontal sinusitis, the treatment should be equally radical, the same treatment applying to complication or associated disease that may exist in the ethmoid or sphenoid cavities.

In the treatment of empyema of the antrum, as in the treatment of all diseases, we must be governed entirely by the conditions present. No "rule of thumb," as Grünwald says, can be made applicable to all cases, no matter how much alike many of them may appear to be, nor how uncomplicated they may be.

Dr. W. W. Coon, Alfred, N. Y. I am persuaded that the percentages given in the paper will be considerably less when a sufficient number of cases have been accurately diagnosticated. I believe that many diagnostic mistakes are made in regard to antral troubles coexistent with, or closely following, influenza. These cases of specific antral infection run a definite course, lasting from one to two weeks or more when unattended, and are liable to recur upon slight provocation. The upper bicuspids and molars on the affected side will usually be the seat of a severe pericementitis. A bicuspid or a molar so affected may be considered the cause of the antral disease, and treatment will be instituted with that end in view. Whereas if the antrum is opened and properly irrigated, the tooth will require no treatment. A full understanding of such cases will, I think, reduce the dento-etiological percentage to ten. Dr. F. H. Koyle, an eminent rhinologist of Hornellsville, N. Y., has had ninety antral cases with but one traceable to dental disease.

For the purpose of carrying out antral irrigation, I object to the tooth-socket avenue, as I consider it an altogether unsanitary procedure. An opening drilled through or near the canine fossa in such a way as to allow the overlying soft parts to form somewhat of a valve, will be all-sufficient if only irrigation is required.

The recorded case of a three-months' old baby—I wonder what Dr. Cryer of Philadelphia would say to that. We are indebted to Dr. Cryer's investigations for the elucidation of the many shapes and sizes of antrum; in fact he has discovered so many variations that we can hardly say when an antrum is normal. I had an idea that in a child of three months the antrum was not developed.

J. M. Ingersoll, M.D., Rochester. The paper and Dr. Roe's discussion seem quite complete in regard to the data on diseases of the antrum. I presume all of us know that there is a variety of causes for this disease. And among these causes of course those of the teeth and alveolar process contribute, but I do not think that any of us, no matter how well informed we may be in our branch of science, would dare to say that the majority of the cases are due to one thing or another. The dental surgeon is necessarily interested, particularly in those cases arising from the teeth and alveolar process; and the medical profession is naturally more interested in those cases arising from diseases of the other sinuses and of the nasal cavity. In my own experience I have seen a number of cases that I was satisfied were due to diseases of the teeth: I have seen more in which I found the disease due to infection in the nose or in the accessory sinuses of the nose, and as Dr. Roe remarked, the ethmoidal cells contribute to the cause of this disease more than all of the other sinuses. You will find in a number of these cases a complication with the other sinuses, and we not infrequently find all the sinuses involved with the antrum: these cases are where the teeth are perfectly sound. Infectious diseases are probably the commonest cause of diseases of the sinuses.

Dr. J. Q. Byram, Indianapolis, Ind. I am unfortunate in that I am a victim of antrum trouble. I have had three operations performed on my right antrum, and I still wear a plug. In 1896 I consulted a personal friend, one of the best rhinologists in our city. We decided to open through the canine fossa, and after giving me all the chloroform that he thought I should take and having me half anesthetized, he began drilling, and I want to tell you that the nose and throat specialist can hurt just as much as the dentist. The antrum was malformed, and instead of finding a thin plate of bone, he found one one-fourth of an inch thick. I wore a tube for six months and as everything appeared quite well, I thought that the case was entirely cured. I allowed the opening to close and it remained closed for more than two years, when, as the result of a severe cold, the middle meatus became closed, mucus accumulated, and it was but a short time before pus was again forming in the antrum. As the upper second molar was pulpless, we decided to extract it this time, and made through the alveolus an opening into the antrum as large as the diameter of an ordinary large pencil. The antrum was again curetted, I wore a plug for a year, and when the trouble had apparently ceased I allowed the antrum to close again. It remained in good condition for about two years, when I again contracted a severe cold and the same complications arose. This time we decided to extract the first molar; consequently I have lost two molars, and I am still wearing a plug.

It is not uncommon for us to hear the dentist speak of curing certain diseases of the antrum, but I believe in many cases the cure is only temporary. Under normal conditions I think we have but very little trouble with the antrum. I am sorry that the essayist and Dr. Roe did not go more into detail regarding the treatment of these chronic cases. My experience and observation has been that in these cases where the antrum is malformed it is safer to allow the patient to wear a plug. Dr. Roe spoke of using a tube, but I condemn the tube. The plug fits tightly, and the antrum can be washed every morning and the plug cleansed, and I believe I keep it as antiseptic as it is possible to keep it; at any time when I contract a cold I have the opening for drainage, and I propose to wear the plug until I go to the hospital and have the buccal plate of the antrum removed.

I want to say a few words about operations upon the antrum. I believe there is no work of our profession allied so closely to the medical profession as that of antrum treatment, and consequently the physician and the dentist should be more closely allied and should consult each other on these cases. There are many cases where the cause lies in the teeth, and others in which the infection has spread from the nose. In the latter cases treatment through the mouth by the dentist would not remove the primary cause; while in the former the rhinologist, if he should not consult the dentist, would be just as much in the dark as the dentist himself. It is my practice when I have a case of antral disease, to refer the patient to the rhinologist, in order to have him examine the nasal passages and ascertain their condition. We then work together, probably extract a tooth, treat the antrum through the alveolus, and at the same time treat the nasal passages, should they have been found abnormal. We make an opening large enough to curette the antrum. Opening the antrum with a small bur is poor practice. I use a large trephine, and I make the opening large enough to insert a finger if I should find it necessary to do so. In this way the antrum can be easily curetted.

Dr. Roe has shown specimens of many malformed antra, so that the opening if made through the canine eminence is likely not to reach the floor of the sinus, but to emerge just above it. Consequently I believe that in order to secure perfect drainage, the best way is to make the opening through the tooth-socket, and then instead of having the patient wear a tube have him wear a plug, which can be thoroughly washed, and which fills the cavity so that no débris can get into the cavity.

A Member. What kind of a plug is used?

Dr. Byram. It is a silver plug and it is very easy to make, much easier to make than a crown. After the opening has been made, take a mandrel smaller than the opening in the antrum, bend a piece of silver round it, solder floors on to both ends, leaving a flange on one end. When placed into position you will find that granulation tissue will fill around the plug so that it can be retained without any difficulty.

Philip Conboy, M.D., Rochester. I rise to discuss in particular the treatment of suppurating chronic sinusitis.

Hajek of Vienna is probably the best authority on cases of this kind. He conducts a clinic in Vienna in which he treats several thousand cases yearly, and he has come to the conclusion that chronic suppuration of the antrum should be treated by making a large opening beneath the inferior turbinate down to the level of the nasal floor. All secretive tissue is curetted away. Irrigation with a saline solution is a routine procedure with him. The strong point for that treatment is this: No matter how large an opening is made in the alveolus it will close, and Dr. Byram is right in advocating a large opening. How are you going to keep the antrum clean when, during the three or four meals a day taken by the patient, food will come in contact with the alveolar opening, even though a protective plate be worn? It seems that making an opening—as large as the nasal wall of the antrum will admit of—beneath the inferior turbinal so that free irrigation of the cavity can be made is the best plan, as we have in the antrum one of the most troublesome places to guard against infection, always remembering that all pathological conditions of the nasal chamber should be removed. This is the treatment to be carried out in chronic suppuration of the antrum.

Now, a few words along the anatomical lines. Take the frontal sinus: The secretions from a frontal sinus empyema passes through the naso-frontal canal into the infundibulum, and empties into the middle meatus of the nose—a discharging ethmoiditis or a maxillary empyema will do the same thing—and how can one determine where pus originates when found in the nasal cavity? Does it come down from the frontal sinus, or from some of the other sinuses mentioned? When pus is present in the nasal chamber, the first thing to do is to make a diagnosis by exclusion. First exclude one sinus, then another, until you finally sift it down from where the pus comes. I would suggest that all men who undertake this line of work become familiar with the articles and book of Dr. Logan Turner on the sinuses, because of the information they contain on comparative anatomy in regard to sinuses and the different kinds of disease of those cavities. His book is the best work of which I know on this subject. A minute detailed knowledge of the nasal chamber is absolutely essential for the proper treatment of the antrum. Do not let anyone mistake the fact that pus in the antrum is not a simple thing to treat. You must always be careful in making a prognosis.

Dr. BYRAM. I would like to ask Dr. Conboy a question. I am not able to understand—I admit that I have not seen the operation of which he speaks—how he makes such an opening through the inferior meatus into the antrum and prevents infection, especially in large dusty cities.

Dr. CONBOY. Probably the acme of surgery is the cataract operation, and we know that very little attempt is made to sterilize the eye as a preliminary to this operation. The nasal mucous membrane is very resistant to the action of germs, and we know that this is also true of the tissues of the oral cavity.

Dr. BYRAM. I grant you that, but presuming with the use of the tube that you occasionally get a small quantity of food into the chamber, is there greater probability of infection from that than from inhaling the different microbes in our cities?

Dr. CONBOY. I can only say in reply to this, as Dr. Hajek did in reply to a similar question, that he had had many thousands of these cases, and he had come to the conclusion that this method was the best.

Dr. BYRAM. Does that operation affect speech to any extent? Does it cause a peculiar nasal twang?

Dr. CONBOY. You can remove the inferior turbinate on both sides, or the middle turbinate on both sides, and leave the ethmoid sinuses, and it is very seldom that a nasal twang results.

H. W. HOYT, M.D., Rochester. There was one thing I noticed in Dr. Faught's paper which I consider to be wrong treatment. It seems that the majority of these cases were treated with hydrogen dioxid. Hydrogen dioxid in all of its forms is not a germicide; it simply destroys the material on which the germs live. When forced into the sinuses the effect is to drive the germs into the still smaller cavities. Just as soon as it comes into contact with pus, it oxidizes it and drives it ahead of itself, so that I have given up using this remedy in cavities. It is a good thing in open spaces, around the mouth, cleansing the teeth and gums, etc., but in cavities I think it is contra-indicated.

The essayist says there has been lack of harmony between the physician and the dentist as to the proper treatment of the antrum. There has been, probably, as much difference between the physicians themselves as between the physician and the dentist on this subject, and I think my friend Dr. Byram struck the keynote when he said that the physician and dentist should work together, because not only all cases are not from the same source, but furthermore because there may be a combination of causes. I have had several patients who have had teeth extracted for facial neuralgia, presuming that the teeth were the cause of it, but I now think it would be hard to find a dentist, especially among the younger men, who would extract the teeth for neuralgia without first consulting the surgeon or specialist of that region. I think that as a rule the extraction of the teeth for neuralgia is not satisfactory, and it seems cruel to be obliged to lose good teeth and still have the neuralgia continue.

Dr. Roe (closing the discussion). The antiquated method of simply making an alveolar opening and inserting a small tube for the purpose of washing out and draining away the overflow of pus, is fast being relegated to the past. As I have before stated, this alveolar opening, which should be a very large one, is to be made in those cases only in which a tooth is the cause of the trouble, and is to be regarded as only a temporary expedient in recent cases that are soon cured. While this route has the advantage of affording in most cases the best drainage and the easiest method of washing the cavity, it has the disadvantage of draining the pus into the mouth, attended with the danger of systemic infection from the swallowed pus. No one at the present time can question the importance of making a sufficiently large opening to enable us to deal with the pathological condition in the interior of the antrum in a thoroughly surgical manner. The choice of operations depends mainly, as I have said, on the relative height of the floor of the antrum and the floor of the nose. If the floor of the nose, the external operation through the canine fossa should be chosen; if, however, above the nasal floor, the nasal route should be selected. The naso-antral wall should then be so freely removed as to make the lower portion of the nasal passage and antrum practically one cavity, which can readily be washed out without the slightest inconvenience to the patient. I have two or three patients at the present time who can wash the nose and antrum as readily almost as they can wash their faces. In making this large opening it is sometimes necessary to remove the lower turbinate.

It goes without saying that a thorough knowledge of the anatomy of the parts is as necessary to successful work in this region as in any other.

Dr. Logan Turner I know very well, and he has given us a most excellent work on "The Accessory Sinuses of the Nose." In addition to Zuckerkandl I would also mention Grünwald on "Nasal Suppuration," and also Cryer on "Anatomy of the Face," as quite worthy of study.

In regard to the recorded case of an empyema of the antrum in a three-months'-old baby mentioned by Dr. Coon, the maxillary antrum exists in a rudimentary form at birth, and does not attain its full development until about the age of fifteen years; therefore, it is possible that the baby had empyema, if the antrum was well or even slightly overdeveloped.

I fully sympathize with Dr. Byram, as there is nothing like a little personal experience to make one appreciate the importance of many so-called minor ailments. The only way for him to get rid of his trouble is to have the cavity absolutely obliterated by a radical operation, as he suggests.

In regard to the use of hydrogen dioxid, I also regard it a dangerous agent to use in cavities, not only of the accessory sinuses, but in the ear and other cavities. The ordinary antiseptic solutions commonly used as detergent washes serve their purpose in these cases, but the two that I have found the most serviceable are lysol and formalin in a normal salt solution.

We all should be fully in accord with the sentiment that the dentist and the rhinologist are but two branches from the parent stem—medicine, and that they should work together, not only theoretically but also scientifically and practically, consulting with one another over the cases in which their work overlaps, both for their own respective advancement and the benefit of the patient.

Dr. Faught not being present to close the discussion, the subject was passed.

Dr. W. A. White, Phelps, moved that a vote of thanks be extended to the medical practitioners present at the meeting for their discussion of the paper and for the interest they had taken in the meeting.

The motion was carried, and a vote of thanks extended.

The motion then prevailed that the meeting adjourn until Wednesday morning.

(To be continued.)

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

(Continued from page 605.)

The Clinics.

Dr. J. J. Nelson, Philadelphia. "The Woodward Matrix."

The Woodward matrix is made from cold rolled steel. The steel is cut to the width of the tooth to be filled. It is placed in position, bent to conform to the original contour of the tooth, and with a lug resting against the occlusal surface of the adjoining tooth, the upper edge of the matrix is beveled to facilitate access to the cavity. This matrix is used principally in disto-occlusal cavities of molars and bicuspids in conjunction with a wedge at the cervix, so that the filling may have the proper shape when finished.

Dr. F. L. Fossume, New York. "Removable and Stationary Bridges."

My method is based on the fundamental principles on which any bridge should be constructed; namely, that the pillars and abutments should be connected to and supported by each other, for by their combined strength they are able to withstand many times the stress which otherwise would loosen them. Also in the case of removable bridges the abutments are apt to become displaced, thereby losing the required relative position to one another, this condition being especially apt to occur when the bridge is not continuously worn, as during illness. On the models are shown several cases, two of which are duplicates of cases now being worn by patients. They exemplify the possibility of fully restoring by artificial means the lost and absorbed gum tissue in order to give a full contour and harmonious form to the lips and mouth. At the same time this apparatus enables the patient to keep the mouth and artificial piece perfectly clean. The key to the whole construction, and the novelty of this method, lies in the bar which connects the attachments to the piers, which holding them firmly in place, prevents spreading apart or contraction of the abutments, and gives a solid foundation to the removable piece.

Where a lower bridge is required between the third molar and canine teeth, a gold crown may serve s the attachment on the third molar, and any other appropriate form of attachment may be used on the canine tooth. After these attachments are constructed and placed on the abutments an impression is taken in the same way as for a stationary bridge. On this plaster impression is fitted an iridio-platinum bar, running from one abutment to the other, and fitting neatly on the ridge. The bar is tacked in place with hard wax, and the bar and attachments are then invested and soldered together. The piece is now placed in the mouth, a new impression is taken, and a model made, upon which a piece of platinum is swaged to fit perfectly over the bar and alveolar ridge. On this platinum base suitable attachments are made to prevent the removable piece from sliding out of place, after which the teeth are attached either with rubber, gold, or porcelain.

This method of constructing a separate base and support for the piers is applicable to every case where removable bridge work is indicated, and in my hands it has been a great help.

Dr. H. Phillips, Baltimore. "Practical Method of Paralleling Bridge Abutments Without Devitalization."

Where one or both of the abutment teeth incline toward each other, the teeth are prepared for gold crowns in the usual manner. A gold cap with parallel sides is fitted to the rear abutment, which, when in position on the tooth, will incline in the same direction as the tooth. A section of gold plate is now soldered to the cap so as to fill the space between the front edge of the grinding surface of the cap and the gum margin, extending a little in front of a line parallel to the opposite abutment. This section of gold plate extends to the sides of the cap so as to cover about one-half of the buccal and lingual sides. The cap and appendage is placed in position and a gold crown is made to telescope over the cap. The remainder of the bridge is constructed in the usual manner.

Dr. W. A. Capon, Philadelphia. "An Easy Method of Making Gold Inlays."

The cavity is prepared in the same manner as for a porcelain inlay, and the matrix is made of either gold or platinum. While the matrix is still in position, pack and partly condense crystal gold at the bottom of the cavity, withdrawing the two together, and tracing the matrix to the edge of the cavity with rouge or whiting to prevent the solder from flowing over the edge of the matrix. The matrix is then laid on a soldering block and is heated sufficiently to allow for the melting of 22-k. solder into the crystal gold, which absorbs the melted gold like a sponge does water.

The advantage of using the sponge gold is that it adds stability to the matrix and bridges any break which may occur in the matrix. Contours are made by melting plate scraps into different forms, and by placing them at the points where the contour is desired. After the inlay is made the excess matrix is trimmed off and the inlay is tried in the mouth. It is then partially finished and set with cement, leaving the final polishing until after the cement is thoroughly hard.

Dr. J. E. Power, Providence, R. I. "Treatment of Fractured Jaws."

Dr. Power's clinic consisted of a demonstration of materials used in making impressions for making splints for fractured jaws. He also demonstrated the making of the model by first breaking it, and subsequently reconstructing it. He demonstrated the making an adjustment of ten different kinds of splints, showing those best suited to certain kinds of fractures. The clinician paid particular attention to the use of the aluminum splint. The advantages of this splint over others he claimed were cleanliness, the ease and rapidity with which it was constructed and adjusted, and the freedom of motion given to the injured jaw. This splint is cemented to the teeth by holding the fragments in correct apposition. The aluminum splint enables the patient to masticate ordinary foodstuffs.

Dr. H. E. Kelsey, Baltimore. "A Case of Irregularity, Presenting Extreme Protrusion of the Mandible with Accompanying Retrusion and Lack of Development of the Maxilla and Bones of the Face, Corrected by the Application of Reciprocal Intermaxillary Force and Skull- and Chin-Cap."

The case shown in this clinic was that of a young man nearly twenty-six years of age at the time the first appliances were inserted, which was in May 1904. Three ring anchorages, extending from the second molar and the second bicuspid, were applied on both sides, above and below, from which extended arch wires passing around the outside of the teeth, to which were wired or ligatured all the teeth anterior to the anchorages in both arches. The upper arch wire was sprung out before insertion for the purpose of expanding the arch laterally, and was screw-cut and supplied with nuts anterior to the anchorages, obtaining thereby a wider range of forward movement of the six anterior teeth. This restored to a considerable degree the spaces occupied by the first bicuspids before their extraction, which occurred at an early age.

The position of the mandible presented conditions analogous to those of forward dislocation, the condyles being about three-quarters of an inch forward from the ear and remaining in that position during the opening and closing of the mouth, thus permitting only a hinged up-and-down swing of the mandible, and almost entirely preventing, by their inability to leave their sockets, the very important lateral masticating movement.

It was desirable, therefore, at the outset: First, to induce the maxilla and all the adjacent osseous structures to resume that natural development which had been retarded at some time prior to the patient's maturity, or entirely discontinued at too early an age on account of some influence not clearly indicated, but which may have been the effect of throat or such nasal obstructions as adenoids. Second, to bring about a reciprocal movement of the maxilla and mandible, thereby bringing the condyles of the mandible back into their normal position and establishing the functional masticating movements of the organ. Third, to so alter the position of the teeth themselves as to bring about a proper and correct relation between the upper and lower teeth, and to produce those natural sweeping curves which are so manifestly absent in the original casts, and which constitute so much of the beauty and usefulness of the teeth; and finally, as a result of the foregoing operations, to establish a normal occlusion which would enable the patient to masticate food as nature intended, at the same time greatly improving the facial appearance and facilitating nasal breathing, which was almost impossible previous to the operation.

That the above desirable changes have been accomplished, and that the case has been brought to a successful and if not ideal at least fairly satisfactory conclusion, is attested by the patient himself, and by a comparison of the original casts taken before the case was begun with those taken since its completion.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, February 1906.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, February 20, 1906, at the Academy of Medicine, No. 17 West Forty-third street, New York city.

The president, Dr. Van Woert, occupied the chair.

The paper of the evening was read by Dr. A. DEWITT GRITMAN of Philadelphia, on "The Regeneration of Dental Prosthesis."

THE REGENERATION OF DENTAL PROSTHESIS.

During the period from 1830 to 1850 mechanical dentistry was emerging from what might be designated as the Ivory period. The Ceramic age began prior to the latter, and although it was imperfectly developed, yet it was a decided advance over that which had preceded it.

The mechanical dentistry of 1830 was very peculiar. Teeth were made in crude blocks, with but little attempt at artistic formation. If the front block assumed somewhat the form of the natural teeth, it was sufficient. The posterior portion might be anything in general contour, from that of a huge bean to an elongated chestnut. All that was at that time demanded of artificial teeth was masticating surfaces. These teeth were attached to either gold or silver plates.

The teeth were hand-carved, and the blocks were drilled through in several places at the biscuiting stage for the purpose of carrying gold or silver wires to be fastened to the plate, thus forming the attachment for the teeth.

This was done in two ways: The first, the crude, consisted in marking the plate where the pins touched it, afterward punching holes for the passage of the pins. When prepared, the pins were cut close to the plate and riveted on the palatal side. The other and more mechanical method was to solder pins to the plate, attach the block, and rivet the head in the tooth. The lower denture was treated in the same way.

In the fourth decade of the last century, dentists began to abandon the personal manufacture of block teeth, and resorted to single plain teeth without gums, furnished by supply houses. This meant an increase of soldering, with its accompanying dangers from overheating. The usual methods at that period were exceedingly crude. Teeth would be ground to the plate singly and soldered in the ordinary way. The articulation was obtained then practically as now. When the operator was satisfied that it was correct, the plate was fastened down on charcoal by means of wire clamps, and a mixture of plaster and sand was run around the teeth. This left the lingual surface of the plate exposed. The soldering at that time was done by means of an alcohol lamp and mouth blowpipe. Atmospheric pressure plates were unknown; all partial dentures were held in place by clasps of half-round wire, and full dentures by springs.

The difficulties attendant upon this kind of metal work forced the dentists of that period to become familiar with a certain phase of the jeweler's trade, and devise ways and means to meet the growing difficulties.

At that time, one had to invent his own processes, as dentists had not overcome the old-time reluctance to make known their particular methods of procedure.

The plates were finished by the aid of gravers and chisels, scratches were removed by means of suitable scrapers, and the surface was Scotch-stoned by hand until the surface was perfect. Then burnishers of highly polished steel were used upon the surface, with castile soap, until it assumed a mirror-like finish. It was then submitted to rouge-carrying buff wheels or hand brushes. Plates thus made were no discredit to the jeweler.

About 1858, all this suffered a change through the advent of rubber. With it came lower prices and a lower grade of dentistry, because it did not require the skill to manipulate it which metal demanded; and for a time it seemed that prosthetic dentistry was doomed, so far as the skilled part of it was concerned.

Not for one instant do I wish to reflect on the skill of those metal workers of the early time, but the ease with which vulcanite was manipulated made it possible for a man to learn the method of using it in a few months, and this serving as an incentive for many unskilled workers to take up dentistry, the country was soon flooded with the results of an inferior grade of work.

Vulcanite, undesirable as it may be in many ways, is, however, a desirable material where great contouring is needed, because of its lightness and resistant qualities. A metallic base, with a bulk of porcelain equal to that of a vulcanite plate of ordinary thickness, would be in many cases impractical.

Gradually, out of the depth to which vulcanite had sunk the prosthetic art, a glimmer of light became perceptible; for then came the block teeth, and still more light was thrown on this complicated problem when the anatomically constructed plain teeth, with their wonderful possibilities—as far as the esthetic part is concerned—were made available.

There are few deformities more repulsive than those resulting from the loss of the teeth, or those caused by a denture that has been constructed purely from a mechanical and commercial viewpoint. Prosthetic dentistry is mechanical dentistry plus artistic skill. Among all the patients with whom we come in contact, there are not two that have the same facial expression. Each patient should be made the object of separate and special study, and oftentimes it is not an easy task to restore the patient's facial expression to our entire satisfaction. It is not enough that the patient should be satisfied, but we should be our own rivals and severest critics.

The illustrations about to be thrown upon the screen [some of these are here reproduced, see Figs 1–8], will emphasize these remarks. They are intended as examples of the possibilities of prosthetic dentistry, showing actual results achieved. By demonstrating the immense cosmetic benefit, to say the least, accruing to the patients, they serve to show that the pains taken to judiciously adapt prosthetic intervention to the individual case by the enthusiastic worker in this field will be amply repaid.

Many of the ills from which mankind suffers can be traced back to a faulty masticatory apparatus. In some cases many of the posterior teeth are missing, either from the maxilla or mandible, or both. In fact, many are entirely without posterior teeth, and are thus deprived of the mill that nature gave them to properly prepare the food before it passes on its journey down the alimentary canal. The food thus improperly prepared is taken into the stomach, the digestive organs are overtaxed, and when they in time are incapable of performing their function, people wonder why they are the sufferers of the many aches and pains that follow the improper mastication of food.

The health of the people requires that food be properly masticated, and if this be done, it means increased gastric ability, and insures to a great degree the continuance of mental power to an advanced age.

When all else has failed, the edentulous patient turns to the prosthetic dentist with the query, What can you do for me? It is then that the prosthetist realizes fully the responsibility of producing dentures that will not only restore the facial expression, but will first of all restore that most important function of mastication. When we have accomplished this successfully, we have in the full sense of the word added to the sum total of human happiness.

Prosthetic dentistry should be judged by the best that it is capable of accomplishing, not by the show-cases that are today too conspicuously in evidence in our large cities. Those products—consisting of pearly white teeth and pink gums—we hope in the process of evolution will become a matter of ancient history.

During the latter period of the metal age, although much of the gold and silver work was beyond criticism, yet the effort to adapt teeth to plates was even in the most careful hands defectively done. Spaces between the teeth and plate being invariably present, nuclei were thus provided for the lodgment and decomposition of organic matter, the products of which are—as is well known—decidedly detrimental to the health of the patient.

Fig. 1.

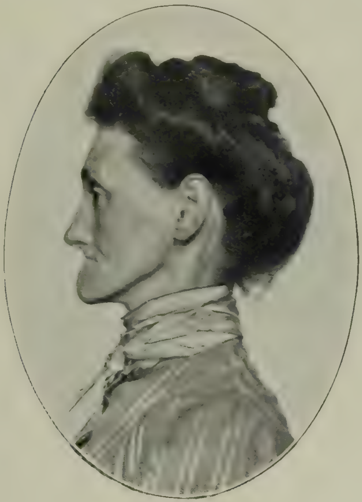


Fig. 2.

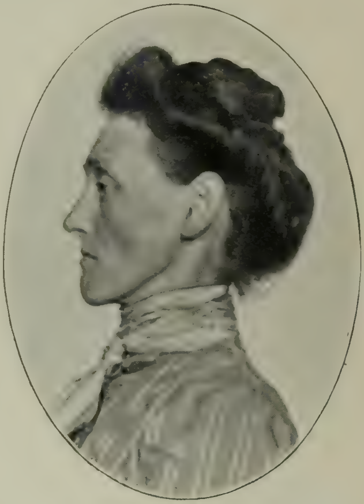


Fig. 3.

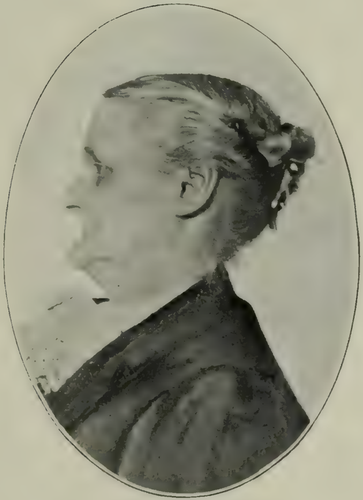
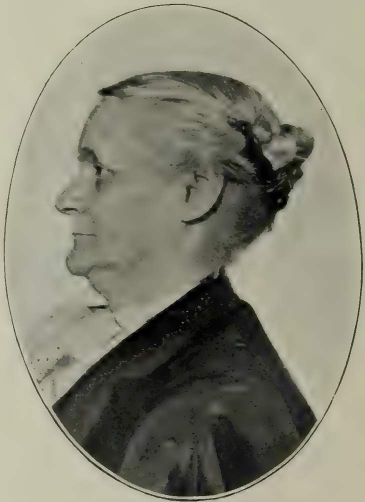


Fig. 4.



The necessarily high price demanded for metal work was a bar to its general use. But today, with the metal base and vulcanite attachments—thus utilizing the desirable feature of the metal age, combined with the desirable feature of the vulcanite and the wonderful possibilities of the artistic arrangement of plain teeth—we have the means for constructing an ideal denture at a cost which is within the reach of the many.

The word prosthesis means replacement—and from a dental standpoint means much more than replacement of lost dental organs, as dentists are called upon not only to restore the function of mastication, but also, from an esthetic view, to restore the facial expression—a phase of the work which should receive most careful consideration.

The use and abuse of vulcanite in prosthetic dentistry, what it has done to

FIG. 5.

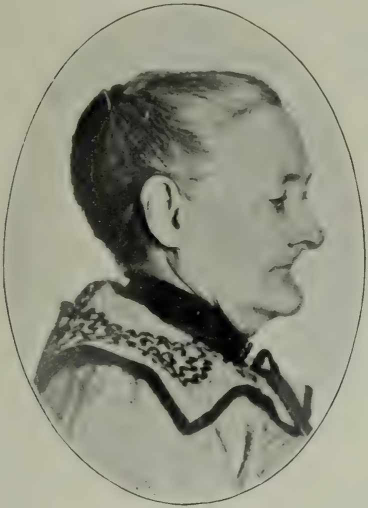


FIG. 6.

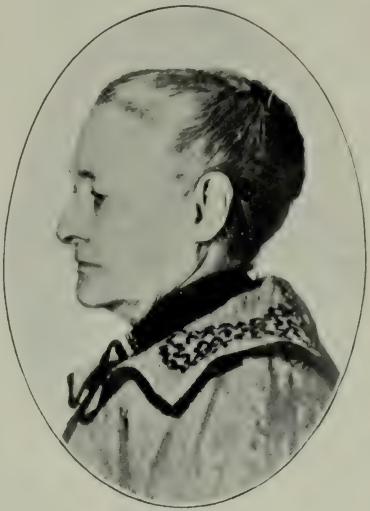


FIG. 7.

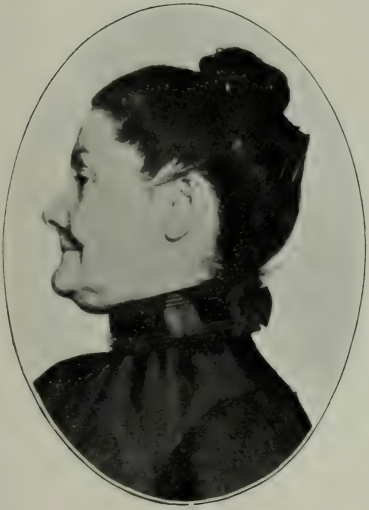
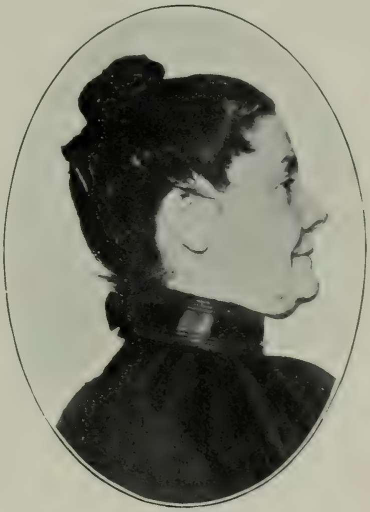


FIG. 8.



dentistry, and the influences it has upon dentistry today, are elements in its development which should be clearly understood and justly appreciated. There has been much said for and against its use. Its cheapness is held by many as its worst feature, but in my opinion this must be regarded in the light of a marked advantage. There is one fact, however, in connection with vulcanite, upon which a few words may not be out of place in this paper.

When vulcanite was first introduced, and for years thereafter, dentists were warned that the mercury in the plates was the cause of serious inflammation of the mucous membrane. Medical men were in arms against its use. The theory was to the effect that the process of vulcanization changed the vermilion—the coloring matter of the rubber—which, setting free mercury in the metallic form, produced a series of phenomena collectively designated under the term mercurial stomatitis. This led to a thorough examination by an association, and it was proved by chemical and microscopic examinations that the theory had no foundation, and that while minute amounts of free mercury could be found in properly vulcanized plates, it could by no possible means secure egress to the surface of the plate.

The investigation by Black proved that the surface of the plate which comes in contact with the mucous membrane was of itself capable of producing inflammation of the membrane, and that it was due not to free mercury, but to the roughness of the plate, which afforded every opportunity for the collection of food particles and for the development of myriads of bacterial forms. This led to greater care in the finishing of surfaces coming in contact with the mucous membrane of the mouth. Polishing was first resorted to, and then the use, as at present by the best workers, of tin foil, which leaves the surface with a high polish. This has measurably overcome the objection, and we now rarely hear of the old-time inflammatory trouble. The committee in charge of this research work was composed of Drs. Buckingham, Wildman, and Truman, the latter conducting the microscopical examinations.

It must be clear to every observant dental operator that the injury to prosthetic dentistry was not in the introduction of rubber as a base, but in the lack of that artistic ability necessary in order that the material should add to the comfort of the patient, by artistically concealing the defects produced by time and disease.

Discussion.

Dr. Hector Griswold, Salt Lake City, Utah. I think there are very few men in practice today who do good metal work. One does not always have the best results from such work, either. Dr. Gritman mentioned vulcanite, and I think cases present themselves where we can obtain far better results with it than with any other material, particularly in those cases requiring restoration of the facial contour lost by absorption. Much depends upon the kind of rubber one uses, the manner of manipulating it, and the method of producing the plate.

Dr. Gritman says that the restoration of the parts requires mechanical dentistry plus artistic skill. I would reverse the statement, and say artistic skill plus mechanical dentistry. To properly construct dentures, it is necessary that the dentist be an artist. You all know that anatomically the face is divided into four areas, and I think it is necessary to consider their relative importance. Forty per cent. of the people who walk the streets today wear artificial teeth. Mechanical dentistry is often beyond the absolute control of the average dentist, from the fact that he examines a case, takes the impression, makes a little articulation (I doubt if he does even that in all cases), and then invites the laboratory man to complete the work. He loses interest, and the work passes from the hands of the artist to those of the artisan.

In the making of plates the first point to be considered is the impression. Most of the imperfect work turned out can be traced to imperfect impressions. Even an artistic man will fail to make a success of his work in the absence of a good impression. Many do not obtain a good model, even after having secured a good impression. Take care of your model as you start to work on it. It is not a question of five minutes, or half an hour; but it may be a question of a long time before one can determine upon a correct facial expression prior to the taking of the bite. I once spent six months in constructing a case of continuous-gum work, but succeeded in opening the bite three-quarters of an inch. I did it gradually. I talked to the patient about different things, would induce her to smile, and during that period I studied the expression of the face. The lady was perfectly able and willing to pay for my time. She had all my time while she was in the office, and I obtained perfect results. In this case, a continuous-gum plate was made, but one can often get better results with vulcanite.

I had great trouble in selecting the proper tooth for a particular case I have in mind. There is where most of us fail. You select a tooth that you think is of the correct dark shade; your patient knows it is altogether too dark, and yet when in the mouth the color seems to disappear. The life and expression of the face and the lips modify the color of porcelain teeth. White hair will lighten the darkest shade of artificial teeth made. Every time I go to a dental depot, I select some teeth of a dark color that no one else will take. I probably looked over one hundred teeth before I found what I wanted for that case. The patient was displeased with those I wanted to use, yet I chose teeth several shades darker.

I think we make a mistake in setting teeth too close together. The trouble lies in disinclination on the part of the profession to take up this class of work. It is turned over to the assistant. That is not what the average patient desires. Every case is a study unto itself. To my mind, it takes artistic ability to create dentures for edentulous people. We do not want that kind of work—most of us; we want to do a different kind, something easier to accomplish.

I would like to ask Dr. Gritman what his conception is of the terms articulation and occlusion.

Dr. GRITMAN. The occlusion is merely the movements obtained with the plain-hinge articulator; articulation is where the teeth have been so arranged on an anatomical articulator as to reproduce some of the movements as performed by the mandible during mastication, so that the mandible can be moved in any direction, and still the maxilla and mandible will have three or more points of contact.

It is a simple matter to obtain the occlusion, but all occlusions are not articulations. If plates are set up on a hinge articulator, they will be in occlusion only. There is just one way in which the jaws can be brought together so that all the teeth may be in apposition; but if the mandible is thrown from side to side, or protrudes, with but a single point of contact, the plates will not articulate.

When the mandible is thrown forward and all the teeth touch they are in articulation, but where they are arranged so that as the mandible is thrown forward there is but a single point of contact, the teeth are in occlusion.

Dr. GRISWOLD. That very action or movement is one from which I have never been able to obtain satisfactory results, except in the mouth.

Dr. Gritman states also that after the denture is in position, and is vulcanized, we fail in the finishing of the case. This is a very important matter. I make most of my plates of gold, but I use rubber in cases where I think I can get better results, and restore the sunken portions of the face caused by absorption. The finishing of vulcanite is a very important matter. The rubber sore mouth comes from an unfinished vulcanite plate. I am as particular in finishing the part that comes in contact with the tissues of the mouth as I am in finishing the outer surface.

Dr. J. B. LITTIG. The slides that Dr. Gritman exhibited tonight in reference to the articulation are very familiar to me, and I believe very thoroughly in endeavoring to properly articulate artificial dentures. It is all very well to make a restoration, but the question is whether the patient will stand the restoration or not. It is a question whether they will not come back and visit us day after day, and have the teeth filed away until they are somewhere in the neighborhood of where they were before the restoration was attempted. I have a great many cases, and it seems to me they are all cranks. Many times I have gone to the point of taking photographs of a case, thinking that the plates fitted accurately, to find later that the patient would not wear them. It hurt here, and it rubbed there, and after I had rubbed and cut the plate down until it got to where I did not want it, the patient would wear it. It is well enough to talk about esthetic dentistry, but patients will not wear the plates unless they are practicable and comfortable.

Dr. Gritman's is the true way of articulating teeth. By his method the force of a tooth which is bearing upon the lower second bicuspid, instead of forcing the plate outward forces it backward, and holds it in place instead of throwing it out by virtue of the leverage which would result if the teeth were set otherwise.

One thing I want to say, which Dr. Gritman did not mention when he spoke of wearing a temporary set too long. The suction they make upon the lip draws the lip in, and very frequently a second ridge is formed. Men advise cutting away the newly formed ridge, but there is no necessity for it. I put in a permanent set the other day, where I followed out the first ridge. Remove the cause, and let nature take care of it, and the plate will go down as nicely as can be.

Dr. J. H. MEYER. The charts shown tonight indicate a beautiful occlusion, such as nature sometimes produces. I would term it an ideal occlusion; but when we are called upon to make an upper and lower denture, if we follow nature's lines, I fear that our patients would be in a sad predicament. Were we to set the artificial teeth where nature had placed them, the teeth would be too far away from the plate, and would in a measure prove useless for masticating purposes. Is it not more reasonable that the teeth should be placed over, or nearly over, the alveolar ridge, and articulated in such a manner that the pressure of mastication be more over the inner than upon the outer margin of the natural gums? When this plan is followed it will prevent the plates from being dislodged from one side while chewing on the other. It should also be remembered that the mandible is a floating bone. I have practiced this specialty for over thirty-five years, and am satisfied that the closer the teeth are set to the ridge the better they are for masticating purposes and for avoiding the splitting of the plate, which we so often see in all classes of dentures.

As to the occlusion, in my practice I cannot obtain the good result claimed by the essayist where teeth are locked in such a manner that the patient will have to bring them together to suit that relation. If a slight deviation is made, one of the plates is dislodged, usually the lower. While it is claimed that the teeth so arranged should have five points of contact, what effect will the muscles of the mandible have upon the plate while the patient is feeling for the points of contact? I use a plain articulator with good results, and when articulating an upper with a lower denture, I grind off the sharp cusps in such a manner as to still retain a good occlusion, and also permit the rotation of the mandible without disturbing either set.

As to the restoring of the features, credit should be given to my old preceptor, Dr. John Allen, who distinguished himself by the reading of a paper before a meeting of the American Society of Dental Surgeons held in New York city in 1845, when that association gave his method hearty indorsement and presented Dr. Allen with a gold medal. I have followed in his footsteps for the past thirty-five years, and experience teaches me that if the attachments are rightly formed and properly adapted with skill and judgment, they will cause no discomfort in wearing them. I therefore do not agree with Professor Littig as to the impracticability of large restorations.

Dr. L. C. LeRoy. There is one point that the previous speakers did not touch upon, which is most important. It is in the taking of accurate impressions for full upper or lower dentures that we meet with the greatest difficulty. Some may feel like contradicting me, but let me explain why. The fault lies in the construction of the impression tray, as made today.

Taking impressions of mouths for which partial dentures are to be made is not so difficult a matter, because the remaining teeth hold the impression in position, and no movement of the impression results; but in taking an impression of an edentulous maxilla, for instance, there is a tendency—because of the shape of the ordinary tray—to bring the pressure on the palatal surface (an inclined plane), just back of the intermaxillary bones, and to move the tray forward. That means a space between the alveolar ridge and that part of the impression tray, and the subsequent work will be defective from that moment. My method of taking impressions—which I have found very successful—consists of building up the palatal portion of the tray with wax or impression compound, or spanning the arch of the tray with heavy German-silver wire soldered to either ridge—the latter is best—so that when pressure is applied to the tray to hold it in position, it is naturally backward, dragging the labial portion against the alveolar ridge. By this means the resulting impression is relatively good.

When we attempt to take an impression and hold the tray in place with the fingers of either hand on either side of the ridge, the pressure is uneven, and again we are liable to meet with failures; but if one finger only be used, and the pressure directed upward and backward against some medium such as I have recommended, no slipping forward will take place. The same thing applies to the lower impression, but probably to a lesser degree.

In lower impressions this defect is likewise readily overcome by having a wire soldered to the impression tray in the same fashion as on uppers. I have met with very few failures; as few probably as one is likely to encounter in dental practice in making artificial substitutes. I was educated from the beginning to construct my own work, and I still do most of it to the point of investing prior to vulcanizing. The taking of the impression and the selection of molds of teeth, the arrangement of the teeth on the model, the waxing up of cases, I consider as pertaining to my own work.

Try that method of impression-taking; you will find that the plates stick so firmly that in many cases they are removed with some difficulty, because of the positive adaptation of the plaster to all parts.

Dr. M. L. Rhein. I want to say a few words on this subject from the standpoint of the man who does not do the work. We have listened this evening to a magnificent exposition of what modern prosthetic dentistry can accomplish. We have heard a few little slurs cast at the dental practitioner who does not do this sort of thing. I do not know how they do it out west, in Salt Lake City, but the practitioners in New York who do not do this work have an idea generally of what they want to have done, and they know when their directions are successfully carried out. The results are generally reasonably satisfactory, so far as proper articulation and usefulness of prosthetic restoration go. There is no question that this is as important a subject as any that comes up for consideration in a dental office; but I take issue with every man who has said this evening that it is necessary for a man to do this work himself. What is necessary is that he should have a thorough understanding of the principles involved in this work. He should know what the facial contour should be. He should know how to reproduce properly; he should know what he wants to have done, and there is no doubt in my mind that the best results are accomplished if the man who does the work is brought into personal communication with the patient. I do not take issue with that statement for one moment: but I do take issue with the statement made here that the man who does not do this work does not know anything about it, and does not know how it should be accomplished.

I know from personal experience and observation at the University of Pennsylvania, of the wonderful results Professor Gritman has accomplished by the articulator which he has introduced to the profession. The difference between a restoration where the teeth are anatomically arranged in the manner so well shown pictorially by the essayist this evening, can only be properly appreciated—I say this with all due deference to Dr. Meyer, because I value his skill on that subject—by seeing cases articulated in this way, and comparing the use the patient can obtain from such a set of teeth, with a set of grindstones articulated in a flat way by grinding and rubbing the surfaces of the teeth. That is about the comparison we can make with the occlusion of which Dr. Meyer speaks and the one the essayist describes. We all know what a beautiful workman Dr. Meyer is, and how beautifully he can make a plate; but I do take issue with him as to what our present-day needs are concerning the articulation of a set of teeth. I have taken the liberty of saying what I have in behalf of some of my silent friends, who do not do this work themselves, but who know perfectly well what they want to have done.

Dr. JARVIE. Dr. Rhein has just voiced my own sentiments so completely that I will not take your time by reiterating them. I was very much interested in that part of the paper relating to the early history and description of prosthetic dentistry of this country. It was my privilege from the time I was eighteen to twenty-two years of age—from the year 1859 to 1863—to be with Dr. W. W. Codman, in Boston. During the four years I was with him we made every tooth that was used in the office. They were carved block teeth. The blocks were arranged a little differently to the description of the essayist. The material was built up on the gold plate which was then universally used, holes being drilled into the plate to correspond with the middle of the bicuspid block, the molar block, and the center block. The center block comprised the four incisor teeth, the next the canine and two bicuspids, and third the molars. Platinum pins were inserted in those blocks, just as we see them today. While the body was in the granular putty-like form, and during the process of carving, a hole was drilled in, the pin inserted, and the blocks afterward baked. As I remember now, there was some beautiful work accomplished in that office in connection with the restoration of the features. At the time, I thought I was wasting four years of my life in learning that sort of thing, but it has proved to be a very valuable experience to me.

The experience then gained in the carving and baking of teeth has been of assistance to me during all my professional career in the artistic arranging of teeth and the restoration of features. The essayist spoke also of the jewelry-like finish of the plate work in those days. I think it is a very proper description of the manner in which the gold work was finished in my early days. I do not see any work coming from the ablest of our specialists today that is superior to the work turned out then. With every phase of artificial work dentists seemed to have taken special pains. I have with me a couple of sets of teeth that I made forty-two years ago. I had forgotten their existence until quite recently, when in looking over the contents of a drawer that had not been opened for a long time I found them. One is a set mounted on rubber, and the other is a continuous gum-plate. They have not been touched since that time—forty-two years ago. Although I made them myself I think I am quite justified in saying that you will not find any sets of teeth today more beautifully finished. The arrangement of the teeth is not such as I would approve of today. I also believe we had better rubber then than we have today, or else we took more pains in vulcanizing and finishing, for I never see any rubber now that will bear the finish that this has. I have not seen these teeth in probably twenty years. We used

Goodyear's whalebone rubber when these plates were made.

Dr. Gritman. I would like to emphasize the point that Dr. Jarvie brought out in regard to the vulcanizing of rubber. I believe that the majority of rubber dentures are vulcanized at too high a temperature, and in too short a time. A denture should be vulcanized at 280° or 290°—depending upon the rubber—for three hours after the vulcanizer has reached that point. In that time a thick lower denture can be vulcanized solid. You can saw right down through the center of a mass of rubber so vulcanized and polish the cut surface, but you cannot do it if you vulcanize at the temperatures at which most of the dentists vulcanize—320° for fifty-five minutes, approximately. It takes perhaps half an hour to raise the temperature to 280° when the steam-gage will record a pressure of sixty pounds. There is less expansion and hence less contraction, less trouble in plate warping, and a better fit by vulcanizing at a lower temperature. The plate is more dense and is capable of taking on and retaining a higher polish. I have obtained better results by so doing than in any other way. I try to teach not to vulcanize at too high a temperature.

Dr. Tracy. I move a very hearty vote of thanks to Dr. Gritman for this very practical and instructive paper.

The motion was carried.

Adjournment.

Wm. B. Dunning, D.D.S.,
Editor N. Y. Odont. Soc.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

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EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, AUGUST 1906.

EDITORIAL DEPARTMENT.

THE DENTAL LEGISLATIVE MOVEMENT IN AUSTRALIA.

IN the issue of the DENTAL COSMOS for January 1905 we discussed at some length the peculiarities of the Dental Act of Queensland, Australia, directing particular attention to the high protective character of certain provisions of the act, which to us appeared to be drawn with the distinct purpose of inhibiting the tendency of Queensland students to secure an American training in dentistry. This was sought to be accomplished by refusing recognition to the American diploma and giving the Dental Board discretionary powers as to admission of candidates to the licensing examination. What gave point to the provincialism of the high protective character of this particular act was the provision for recognition of the *sine curriculo* D.D.S. degree of Trinity University, Toronto, and the exclusion of the American D.D.S. degree earned in regular course.

Another phase of dental legislative evolution has during the present year developed in New South Wales which is interesting from several points of view, and which we shall endeavor to briefly set forth.

The intrinsic importance of all dental legislative effort is sufficient ground for its careful study from time to time, as no other professional activity so clearly expresses the attitude of the general professional mind of a community as its statement in an act regulating dental practice giving the standards of professional requirement and the terms and conditions upon which practice may be permitted.

The problem of Australia is one of peculiar interest: first, because its legislative effort is of comparatively recent date; and second, the Commonwealth consists of but six States, with an equivalent number of dental acts, hence the reciprocity problem with which they are now attempting to deal is in the nature of the case a relatively simple one *per se*, but one which is deriving no small degree of complexity from lack of unanimity of opinion among the promoters of dental legislation in Australia as to the basis upon which reciprocity is to be accomplished.

To those who have given attention to the gradual growth of saner views on the question of dental legislation, and who have at last grasped the fundamental principle that dental laws are primarily for the protection of the public against incompetency in the practitioner and are not class legislation simply for the protection of the practitioner, the attempts from time to time made to introduce clauses solely for the latter object are amusing, to say the least. It is just these special clauses in dental bills which give rise to all the controversy and which so greatly obstruct their enactment into laws.

A case in point is the Dentists Act Amendment Bill of New South Wales, in which among other things the attempt is made to introduce a standard of ethics as one of the qualifications for license, with the result that, because no one can specifically define the ethical standard, it is proposed to leave its definition to the discretionary powers of the Board—and "there's the rub"! It is one thing to have discretionary powers and still another thing to have discretion. A board may have both, but again, a board may have the power but lack the discretion, and then the prospect is anything but cheering. The safest plan for both the public and the practitioner is to eliminate as fully as possible the discretionary feature by making the provisions of the act specific at all points; then, if the board should happen to have discretion, so much the better—it can be utilized in other directions than by succumbing to the temptation to create new legislation in special cases not specifically provided for in the act, which is the result of the "exercise of discretionary powers" when reduced to practical terms.

But why incorporate dental ethical standards into a dental law at all? It seems to be growing clearer as experience broadens, that ethics is not so much a question of law as it is a question of decency and good professional breeding. These are matters which have nothing or practically nothing to do with the technical fitness of a practitioner. Advertising is an offense against good taste, a professional abomination, but not in any degree is it evidence of incompetency to practice dentistry or anything else; hence the forbidding of dental advertising by law is beside the mark in so far as the law is a protection to the public against incompetency. The whole question of dental advertising bears no more necessary relation to professional competency than the announcement in Saturday's paper of the topic upon which a minister of the Gospel will preach the following Sunday bears to his ability to acceptably expound the ethical problem involved in the text of his sermon. Dental ethics in our opinion is a function of the dental professional organization in so far as the creation of class standards of ethics in dentistry is necessary for the ethical regulation of the class. It is futile, and worse, to endeavor to make ethics a function of the dental law; indeed the sentiment of this democratic republic of the United States is clearly antagonistic to the enactment of any such legislation.

It would be a comfort if it were possible to make people ethical by law, but experience shows that our desire for ethical results must in the nature of the case be attained by other means. What we want and what we ought to have in legislation are two widely separated propositions, and it is in the harmonizing of these two factors that our friends in New South Wales appear to be having some difficulty. The initial number of a new Australian publication, the *Federal Dental Journal*, is largely taken up with the matter here under consideration, and among other things it reports the proceedings of the meetings leading to the organization of the Commonwealth Dental Association—a body which announces the following praiseworthy "Aims and Objects":

To establish reciprocity.
To raise the standard of the Dental Profession.
To form a closer union between Dentists throughout the Commonwealth.
To provide a fund for the protection of Dental interests.
To make provision for Chambers as a place of resort for its Members in all States.
To establish a Library of all the latest works on Dentistry in each State; etc.

But not the least puzzling problem with which the Association and its official organ have to deal in the unification movement which they have espoused is the question of the dental degree. So serious is the degree question that it also has intruded its disturbing presence into the proposed Amending Act of the existing dental law. Just why our antipodean colleagues should suffer such discomfort over the degree question is rather difficult to understand, but apparently there is some alarm lest the medical man, the cleric, or the doctor of laws shall lose something of his importance should the doctorate be assumed by the dentist. Possibly the case might look different if some sort of provision could be made by which all legal dental practitioners in Australia could secure the title, but that does not as yet seem feasible. In the meantime, for either or both of the reasons suggested, the dental doctor matter is a warm question; especially is it so because a considerable number of high-grade native Australians come annually to the United States to undergo dental training and secure the degree which they earn at much expense of time and money as well as of hard labor and study. But so strong is the local high-protective sentiment that it is proposed to debar these same enterprising native Australians from the enjoyment of the fruits of their labor by depriving them of the right to use their degree in their native land. The whole scheme looks rather childish from this distance. It should be remembered that the degree "Doctor of Dental Surgery" was created when the first educational institution for the training of dentists was established, in 1839. Before that time there were no means for systematic dental education. The D.D.S. degree is now an established and highly reputable designation, and it is much too late to question the propriety of the degree or its fitness to designate what it does designate. It should be borne in mind that the right of the dentist to the use of his distinctive degree has no bearing whatever upon the use of the doctorate by anyone else who has similarly earned the right to the distinctive use of it. Just why the learned in certain selected lines of human activity should arrogate to themselves the monopoly in use of the doctor title is by no means clear, and we are of opinion that if the relative educational bases of the several professions involved were made the standard of comparison the right to monopolize the title would fail of support.

The milk in the cocoanut in the present case is probably to be found, not in the opposition of medical men or of the so-called learned professions in Australia to the use of the doctor title by dentists, but because no practicable plan has yet been devised whereby Australian dentists as a professional body can secure the degree for themselves. Hence the enterprising few who are able and willing to make the sacrifice necessary to secure the coveted title come back with a distinct professional advantage, and that is more than can be endured; hence our friend the editor of the *Federal Dental Journal* lets the cat out of the bag by the following exhibition of his sore spot:

> If it takes a young greenhorn four years' hard study and practice to become a R.D.S. in Australia, how can a young greenhorn become really "ethical," save three years' study, and secure a diploma? *Answer:* Go to America an "unethical" greenhorn, and you can return in twelve months' time an "ethical" Dr. ———, dentist.

Either the foregoing is intended as a witticism or else it is intended to be taken seriously. If the former, it is such a labored attempt at wit as to be silly; if the latter, it is simply untrue. Will the editor justify his statement by naming one or more "unethical" Australian greenhorns who have obtained an American diploma, become "ethical," and returned in twelve months' time to Australia? If the American system of dental education were really capable of producing such a satisfactory result it would in our opinion well repay the editor of the *Federal Dental Journal* to take just such a course. But we object to the paragraph quoted because it is bad ethically, and absolutely inconsistent with the principles which the *Journal* announces as its excuse for existence. Its "Greeting" reads like a reflection of the spirit of Walt Whitman in its all-embracing, uplifting, demiurgic altruism, and but for the inconsistency of the jealous and untruthful fling which we have quoted would have been applauded by all who love justice and fair play, in or out of dentistry. As it is, we are left in doubt as to which represents the professional motive of the editor, his greeting or his covert kick. We hope that if he does not now, he will in the course of time come to mean what he says in his opening paragraph and practically apply it not only to his Australian colleagues but to the dental world at large when he says:

> To the dentists of Federated Australia—Greeting! To all directly and indirectly connected with the profession—Greeting! To all those people, lay and professional, who have the welfare of struggling humanity at heart—Greeting!
>
> Our excuse for coming to you is that we desire above all things to minimize class distinction, if we cannot abolish it;—to engender good-fellowship amongst dentists;—to establish a brotherhood;—to do all and sundry that may pertain to the advancement of the profession in particular and of humanity in general.

This is all very well, but, in view of the other phase of the matter to which we have drawn attention in the objectionable paragraph already quoted, it seems to us that the hands are the hands of Esau while the voice is that of Jacob.

THE SAN FRANCISCO DENTAL RELIEF FUND.

In response to a circular appeal to the dentists of Pennsylvania for contributions to a special fund for the relief of dental practitioners of San Francisco who were sufferers by the recent calamity in that city, the sum of sixteen hundred dollars has been received at the Dental Cosmos office and forwarded to the national treasurer, Dr. J. D. Patterson, who has acknowledged receipt of the amount, as shown below.

Philadelphia, June 29, 1906.

Dr. J. D. Patterson, National Treasurer San Francisco
Dental Relief Fund, Kansas City, Missouri.

My dear Patterson,—I take pleasure in forwarding you herewith check for $1600, being total amount received to date in answer to an appeal issued by the Dental Cosmos for contributions to the Relief Fund for our distressed colleagues in San Francisco, of which fund you have been good enough to act as national treasurer. The detailed list of contributors and amounts contributed is here appended. We shall promptly forward to you any further remittances that may be received through the Dental Cosmos office.

Kindly acknowledge receipt of the above-mentioned amount and oblige,

Fraternally yours,
Edward C. Kirk.

CONTRIBUTIONS TO SAN FRANCISCO RELIEF FUND.

Eighth Dist. Dental Society of New York, by E. Muntz, sec'y, and L. Meisburger, treas.	$100.00
F. W. Low, Buffalo	10.00
W. Storer How, Philadelphia	10.00
E. C. Kirk, "	50.00
W. T. Bentz, Carlisle, Pa	5.00
Lebanon Valley Dental Association, by C. B. Wagner, treas	37.00
Julio Endelman, Philadelphia	5.00
W. A. Capon, "	10.00
Geo. F. Platt, Chambersburg, Pa	1.00
M. H. Cryer, Philadelphia, Pa	5.00
Max Greenbaum, "	10.00
W. H. Waugaman, Turtle Creek, Pa.	2.00
H. D. Graham, Brownsville, Pa	5.00
H. W. Arthur, Pittsburg, Pa	10.00
D. Staples Gardner, Scranton, Pa	1.00
R. H. D. Swing, Philadelphia	10.00
J. R. C. Ward, "	1.00
J. S. Anderson, "	2.00
R. J. Fitzsimmons, Chester, Pa., for Garretson Dental Society	10.00
Wm. H. Trueman, Philadelphia	5.00
Susquehanna Dental Association	50.00
Lehigh Valley Dental Association, J. C. Hertz, Easton	$10.00
H. W. Bohn, Reading, Pa	1.00
Clarence Wright, Philadelphia	1.00
C. B. Bratt, Allegheny, Pa	5.00
C. A. Dunlevy, Philadelphia, Pa	2.00
G. W. Klump, Williamsport, Pa	10.00
S. H. Guilford, Philadelphia	20.00
Luzerne and Lackawanna Dental Society, by E. J. Donnegan, treas., Scranton, Pa.	25.00
L. Ashley Faught, Philadelphia	25.00
Isaac B. Davenport, Paris, France	100.00
Woman's Dental Association, by Elizabeth A. Davis McDonald, treas.	5.00
W. C. Miller, Homestead, Pa	5.00
Reading Dental Society, by Jno. T. Bair, treas.	25.00
W. H. Gilbert, Philadelphia	25.00
Wm. F. Fine, "	2.00
The S. S. White Dental Mfg. Co., Philadelphia	1,000.00
Total	$1,600.00

Kansas City, Mo., July 8, 1906.

Received through Dr. Edward C. Kirk, Editor of the Dental Cosmos, the sum of sixteen hundred dollars ($1600), contributions to the Dental Relief Fund for the San Francisco sufferers.

[Signed] J. D. Patterson,
Treas. Dental Relief Fund.

Since the foregoing amount was transmitted a check for $27.70, received from Dr. A. D. Weakley, has been similarly forwarded to the national treasurer. The remittance of Dr. Weakley is to cover contributions made by members of the District of Columbia Dental Society in addition to the contributions which most of them had made through other channels. Following is a list of those contributing the above amount:

Dr. Williams Donnally. Dr. J. H. London. Dr. Bruce Taylor. Dr. J. H. Allen. Dr. M. F. Finley. Dr. J. A. Watling. Dr. H. M. Schooley. Dr. A. D. Weakley. Mr. E. J. Lewis.

BIBLIOGRAPHICAL.

A MANUAL OF MECHANICAL DENTISTRY AND METALLURGY. By GEORGE W. WARREN, A.M., D.D.S., Professor of Clinical Dentistry, Pennsylvania College of Dental Surgery. Second Edition, Revised and In Parts Rewritten. With One Hundred and Seventy-nine Illustrations. Philadelphia: P. Blakiston's Son & Co., 1905.

In the book before us Dr. Warren has gathered a considerable amount of useful information on practically every phase of that interesting department of the dental curriculum of which it treats.

The author has treated his subject in a clear descriptive style, a feature of the book which should at once appeal to the dental novice for whom, doubtless, the manual is mainly intended. In addition to the subject of mechanical dentistry proper, some sixty-odd pages of the total of two hundred and fifty-seven pages which the book contains are devoted to a study of the fundamentals of dental metallurgy, and here again Dr. Warren's efforts have produced most satisfactory results.

Notwithstanding the foregoing favorable comments on the *ensemble*, we feel that some allusion should be made to a number of oversights and inaccuracies, which we fear may lead either to a confusion of ideas or to the assimilation of erroneous information on the part of the inexperienced student.

On page 7 we find the statement that modeling composition is more desirable than wax "on account of its taking a somewhat sharper impression and being somewhat more elastic than wax." This would imply that wax is somewhat elastic, when as a matter of fact it utterly lacks elasticity.

We note, particularly on page 8, an absence of uniformity in chemical nomenclature as exemplified by the use of the terms *chlorate of potash* and *potassium sulfate.* On page 5 the formula for hydrogen sulfid is given as HS, when it should read H_2S, and the same error occurs on the first and seventeenth lines of page 53.

On page 104, in the description of the method of preparing silver nitrate, reference is made to the fumes of *nitrous gas.* From a chemical standpoint this is incorrect, for the red fumes which are evolved when nitric acid is subjected to a high temperature are due to the decomposition of the acid into nitrogen peroxid (red fumes), oxygen, and water. On page 161 "arsenious acid" should be *arsenous oxid,* and "neurocane," *neurocaine.* On page 162 we note the term "pulp-canal," an erroneous way, frequently encountered in dental literature, of describing the canal of a root. Pulp-canal signifies the canal of the pulp, and consequently assumes to describe an anatomical feature of the pulp which does not exist.

While it would be decidedly unreasonable to expect of any book absolute freedom from errors, yet we believe that such oversights as those of the character above alluded to should be eliminated as soon as practicable, for they detract from the educational merits of the book, and produce an impression upon the reader not always in harmony with the true value of the contents.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*Deutsche Zahnarztliche Wochenschrift*, Berlin, February 10, 1906.]

A STUDY IN THE SIGNS OF DEGENERACY. BY DR. MED. DOHEN AND A. SCHEELE, SURGEON-DENTIST.

With the view of determining if possible the so-called stigmata of degeneracy, the authors have carefully examined a series of apparently normal individuals—soldiers selected from the Eleventh Imperial Army Corps—and a series of mentally abnormal men—criminals from the prison of Cassel-Wehlheiden, Fulda, Zegenhain, and from the houses of correction at Wahern and Cassel.

As the result of this investigation they are able to record the following facts as observed in a series of 600 normal and 1011 abnormal subjects, the latter being the total of abnormal individuals examined from the penitentiaries—728, and from the houses of correction—288. Caput quadratum was found in nine criminals, or about 1.06 per cent., and in five inmates of the houses of correction, or about 2.9 per cent., while not a single case was detected among the members of the healthy series. These figures agree with the findings of the criminologist Knecht, who puts the percentage at 2, and with those of Von Gauter, who estimates it at 1.5. Forehead with marked protuberances was observed in ten criminals, or 1.1 per cent., but not a single case among the soldiers. Asymmetry of the face was found in one of the criminal series only. Cleft of the uvula was found in equal numbers in both classes, to the extent of about 0.3 per cent. Retruded forehead was found in nine criminals. This sign was not found among the inmates of the houses of correction or among the members of the normal series. Extremely pointed tongue was observed in the normal series in the proportion of 1.16 per cent., and in the abnormal series in the proportion of 1 per cent. The tongue was found exceptionally wide in 3.8 per cent. of the abnormal series, and in 2.5 per cent. of the normal series. Furrowed tongue was found in 0.7 per cent. of the abnormal series and in 1 of the normal series. Involuntary shaking of the tongue was found with somewhat greater frequency in the abnormal series, where it amounted to 1.8 per cent.; in the normal series the proportion was about 0.16 per cent. Abnormal softening of the tongue was found in 6.6 per cent. of the normal series and in 6.8 per cent. of the abnormal series.

Deflection of the nose toward the right was noted in 10.1 per cent. of the normal series and in 6.9 per cent. of the abnormal or criminal series. Nasal deflection toward the left existed in 3.83 per cent. of the abnormal. These statistics on nasal deflection agree with the observations of Von Gauter among the insane.

The authors then discuss certain aural peculiarities observed in both series, and subsequently take up the deviations in the jaws, teeth, and palate as observed in the two series the subject of their investigations. Criminologists have stated that prognathism is a stigma of degeneracy. The authors have found that a prognathous malformation in which the lower teeth bite against the gingival border of the upper existed in 35 cases of the abnormal series, or about 4.2 per cent., and in 26 of the normal series, or about 4.3 per cent. Retruded jaws, where the lower teeth bite posteriorly to the upper teeth and the mouth is constantly kept slightly open, was observed in 2.5 per cent. of the number of criminals examined and in 2.1 per cent. of the number of normal individuals. Prognathism due to excessive development of the mandible was found in 42 criminals, or about 5 per cent., and in 4 soldiers, or about 0.7 per cent.

In all works upon the subject under discussion authors mention such signs of degeneracy as mal-alignment of the teeth, defective articulation, diastemæ, diminution in the number of teeth, especially the third molars, abrasion and erosion, V-shape palate, etc. All these abnormalities are to be found, in the opinion of the authors, with equal frequency in both classes, and consequently they conclude that the theory of the "criminal born" adopted and defended by alienists is not a tenable one, inasmuch as the signs upon which they rest their claims can be found, as previously stated, in about equal proportion in both the criminal and honest classes.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde*, Zurich.]

THE INFLUENCE OF MASTICATION ON CEREBRAL CIRCULATION. By Dr. Ed. Spitzer.

The author reports the case of a man of unusual intelligence, who had been suffering for about a year from somnolence, weakening of memory, stammering, anemia, etc. The examination proved that there was complete absence of organic lesions, and the clinical history of the case showed that the patient had never suffered from any serious malady. As all the upper teeth were missing, the author at once instructed his patient to seek the service of a dentist, in order to have the missing teeth substituted by an artificial denture. A month after the piece had been in use an improvement became noticeable, as during that time the appetite had increased, somnolence had decreased, and the memory and sight had become more active.

Having observed a number of similar cases which improved after periods of careful and thorough mastication of the food, the author in explanation of the effect of thorough mastication upon the general health states that the cerebral functions being dependent for their proper performance upon the presence of a sufficient degree of blood pressure, a persistent decrease in cerebral circulatory activity will give rise to somnolence, partial loss of memory, stammering, etc. The movements incident to thorough mastication, on the other hand, stimulate the cephalic circulation and thereby the cerebral activities. While in the case under consideration the foregoing mode of accounting for the improvement in the general condition of the patient may be accepted as representing up to a certain point the secondary effects of thorough mastication, there are in the opinion of the reviewer several other factors of far greater importance to be taken into account in the attempt to explain the beneficial systemic effects of thorough mastication. Food that reaches the stomach in lumps which have not been subjected to a process of careful comminution is not wholly acted upon by the digestive fluids, for obvious physical and physiological reasons. The digestive processes under conditions of defective mastication are incompletely and improperly carried out, as the bolting of food into the stomach is usually so rapidly performed that the glandular gastric functions are given neither sufficient time nor the necessary degree of proper stimulation in order that they should secrete a sufficient amount of digestive ferments.

The undigested food soon undergoes fermentation or putrefaction, or both, according to the chemical nature of the food which is not acted upon by the digestive secretions. From gastric fermentation and putrefaction to auto-intoxication is but a short step, and when the latter occurs the appetite soon decreases, the body is poorly and imperfectly nourished, the proportion of hemoglobin in the red blood corpuscles decreases, and consequently likewise the oxygen-carrying capacity of the red cells. Under these conditions of insufficient oxidation and elimination of waste products all functional activities suffer, including those of the cerebrum—those which mostly suffered in the case reported by Dr. Spitzer, who in the opinion of the reviewer has incompletely and defectively reasoned out the several steps in the case, mistaking among other things the secondary palpable effects for the real inward cycle of favorable changes.

[*l'Odontologie*, Paris, May 30, 1906.]

EXTENSIVE NECROSIS OF THE MANDIBLE OF TABETIC ORIGIN. By F. Poteau, Laval, Canada.

The author reports the case of a man aged forty-six suffering from progressive locomotor ataxia of fifteen years' standing, who sought his services for the construction of a prosthetic appliance. The patient's teeth had gradually loosened and were eventually shed at short intervals. As the mucous membrane seemed normal, the author saw no reason to prevent his complying without delay with the patient's request. Upon examination, however, a movable body was discovered projecting from under the place which had previously been occupied by the lower left molar. Mr. Poteau at first diagnosed the body as a root-fragment, but the patient insisted that he had lost all his teeth, and that as none had been fractured, the movable body could not possibly be a root-fragment. Thereupon a crucial incision was made upon the mucous membrane overlying the projecting body, and with an explorer the latter was carefully examined. It was then found to be a sequestrum extending from the region of the first molar to the ascending ramus, and was successfully removed with a root-forceps. The wound was antiseptically treated, and as in due course of time the tissue had healed completely, a vulcanite plate was made to supply the lost teeth and to compensate for the loss of the osseous tissue. Two months after the insertion of the plate inflammatory phenomena developed upon the right side of the mandible, which rendered the wearing of the denture extremely painful, and a newly formed, relatively large sequestrum was again removed. Shortly afterward a third sequestrum, comprising the external plate of the alveolus from the symphysis to the canine, had formed and was removed. Soon after the extraction of the last sequestrum the patient died of bulbar paralysis.

[*l'Odontologie*, Paris, May 30, 1906.]

A NEW ANESTHETIC: NOVOCAIN.

By Messrs. Pinet and Jeay, Professors at the École Dentaire, Paris.

Novocain, which was discovered by Uhfelder and Einhorn, is soluble in one part of water, and the solution thus obtained is of neutral reaction, a valuable feature, as solutions either acid or decidedly alkaline exercise a harmful irritating action upon the skin. Aqueous solutions of novocain can be sterilized by boiling without undergoing any change. The use of novocain in surgery has been investigated by Professor Brandt, and its application to dental surgery by Dr. Sachse. Its physiological action has been investigated by Dr. Bieberpeld of Breslau.

Intravenous injections of solutions of novocain decrease arterial pressure, but Bieberpeld has failed to state whether this phenomenon is a passing or a lasting one. It is claimed that this action is due to the influence of the anesthetic on the vaso-motor centers, but in the opinion of Messrs. Pinet and Jeay nothing has been done to disprove that the decrease in blood pressure is not due to the effect of the agent upon the endocardium, as was shown by Vulpian to be the case with cocain. Novocain inhibits respiration. The fatal dose of novocain in the experiments carried on upon guinea-pigs has been found to be from 0.35 to 0.45 centigrams (5¾ gr. to 6⅔ gr.) per animal.

Professor Brandt employs novocain in his work in general surgery in solutions from ¼ to 1 per cent., to which he adds from five to ten drops of adrenalin solution 1 : 1000. Sachse for dental operations uses it in solutions varying in strength from 1 to 2 per cent. to which he likewise adds a small quantity of an adrenalin solution. In the opinion of the authors the addition of adrenalin to novocain, while it does not intensify the anesthetic power of the agent, does increase the duration of the anesthesia. Although it compares favorably with cocain, novocain does not cause insensibility as rapidly as cocain, but on the other hand it seems to produce an anesthesia of longer duration.

[*Trans. Odontological Society of Gt. Britain*, London, February 1906.]

DISORDERS AND DISEASES OF THE HEART IN RELATION TO ANESTHESIA FOR DENTAL OPERATIONS.

By H. Bellamy Gardner, M.R.C.S., L.R.C.P., London.

The author has used as the text for his article the proposition that people who are able to pursue their ordinary avocations, but who think that they have a "weak heart," in the large majority of cases do take anesthetics exceedingly well. Such cases, however, should not be treated by the anesthetist in a routine manner, but in a scientific spirit, with as full knowledge as possible of their circulatory defects and of the physiological action of the anesthetic.

The author incidentally enumerates the commoner disorders and diseases of the heart and arteries, and describes the symptoms of heart disease as follows:

A history of fainting attacks indicates a failure of heart function which may be determined by subjective causes alone, but may also occur in grave disorders, and should never be disregarded.

Marked shortness of breath on slight exertion, apart from obvious respiratory disease or anemia, indicates that the cardiac walls are degenerated or intrinsically weak.

Pain and palpitation, unless of very frequent occurrence or of persistent character, are not specific signs of heart disease.

Extreme pallor of the face is always accompanied by a weak if not inefficient heart, whether from constitutional disease or a lesion of the cardiac valves at the aortic orifice.

Duskiness of the lips, nose, ears, or fingers, or clubbing of the tips of the fingers, denotes incompetence of the heart, probably due to lesion of the mitral valves.

Edema, or swelling of the lower extremities, is commonly seen in chronic nephritis, but apart from this is due to commencing heart failure in the course of cardiac or pulmonary disease.

If the patient can give no history of such symptoms, and has no appearance of these physical signs, there is no reason to suppose that the heart is weak in proportion to the general system. If, however, the presence of one or more of the signs of disorder and disease mentioned is apparent, further medical examination of the patient should be made before administering an anesthetic.

Perhaps the best method in which to set about allaying a patient's apprehensions of an anesthetic on account of a weak heart is to state in the first place, that neither a dental surgeon nor physician would consider it justifiable to run any appreciable risks from the anesthetic for the sake of the extraction of teeth; secondly, that it is in order to avoid any shock to the system and effect upon the heart that an anesthetic is necessary; and thirdly, that the particular anesthetic recommended is a heart stimulant.

The author then discusses in detail the action of nitrous oxid, ether, and ethyl chlorid, and from his studies draws the following important conclusions as bearing upon the question of the administration of anesthetics to patients suffering from diseases of the heart:

In the first place, in healthy subjects the known mortality risk in anesthesia from nitrous oxid is perhaps one in many hundreds of thousands; from ether is generally stated to be one in fifteen thousand, and from ethyl chlorid, according to Dr. McCardie, is somewhat higher than that of ether.

Healthy subjects can, therefore, sustain a considerable deprivation of oxygen for a brief period in the case of nitrous oxid unmixed, without apparent damage, and in the case of ethyl chlorid can also sustain a tendency toward lowering of the blood pressure in the sitting position for brief periods without undue fear of dangerous effects upon the circulation.

Secondly, in the case of patients who suffer from some heart disorder or disease, but who can follow their ordinary avocations without marked symptoms or distress, nitrous oxid may be safely administered in the dental chair with sufficient oxygen to avoid the secondary strain upon the heart which is brought about by the induction of asphyxial symptoms.

Ethyl chlorid, in the present state of our knowledge, should not be resorted to on account of its tendency to lower the blood pressure, but ether may be administered, and is well borne if great care be taken—by the admission of sufficient air and maintenance of the freedom of the respiratory passages—to prevent the occurrence of asphyxial factors, as in the case of nitrous oxid.

Thirdly, we come to the case of patients with definite cardiac and circulatory symptoms—including those of aneurysm—who show signs of incompetence perhaps even on the slight exertion of walking upstairs or arising from bed.

If a dental operation be necessary in such cases, it should only be undertaken at the patient's own house or in a nursing home, where, lying flat upon the back or on the right side in bed, or preferably on an operating table, they may be anesthetized with every precaution as for a surgical operation.

Preparatory medical treatment by rest and suitable diet should be aided also by the administration of cardiac tonics for several days beforehand; the drugs which produce the best effect for this purpose being strychnin and digitalis.

For these severe cases nitrous oxid should only be given with a considerable proportion of oxygen, *i.e.* from eight to fifteen per cent., or more, according to its clinical effects.

Ethyl chlorid is absolutely contra-indicated.

Ether by any closed method is not well taken, but may be given either on a semi-open mask or in mixture with one-third of its volume of chloroform; and this latter mixture of anesthetics, helped by the addition of a supply of oxygen passing through the mask, I consider has proved the most suitable in cases when more than fifty seconds' unconsciousness is required.

The a tion of this mixture with oxygen in cases of heart disease while the patient is kept in the supine or lateral position, induces an anesthesia representing the golden mean between that of ether and chloroform, maintaining the blood pressure slightly above normal, with a good color, pulse, and respiration, while after-effects are in most cases reduced to a minimum.

[*Revista Odontologica Paulista*, S. Paulo, Brazil, April 1906.]

PICRIC ACID IN DENTAL THERAPEUTICS. BY DR. ULYSSES PARANHOS.

Picric acid, which is also known under the names of carbazotic acid, trinitro-phenol, and nitro-phenisic acid, has the formula $C_6H_2(NO_2)_3OH$, and may be readily prepared by adding coal-tar creasote (impure carbolic acid) gradually to strong nitric acid and heating, when, on standing, the picric acid will crystallize. The salts of picric acid have been used in general medicine. (The ammonium salt has been administered in cases of disturbances of malarial character and has been recommended in the treatment of trichiniasis.—Reviewer.) The acid is soluble in alcohol, in ether, and in water (1:86), and has germicidal properties. Cheron, who has carefully studied the physiological action of picric acid, claims for it powerful healing properties, and has used it successfully in the treatment of ulcers. From investigations on the action of picric acid by Thierry and others, the conclusion may be drawn that it is an efficient germicide, acting through its coagulating power, and in addition by inducing keratogenesis. Upon wounds, picric acid soon induces a process of repair; the epidermal tissues proliferate abundantly, undergoing at the same time keratogenic changes, and wounds and ulcers promptly enter upon a process leading to complete cicatrization. Internally picric acid is toxic, but properly diluted may be employed externally without fear of causing toxic phenomena. In the opinion of the author it is an excellent agent in the treatment of inflammatory affections of the mouth, for its action is both efficacious and rapid. He has successfully employed it in the treatment of traumatic glossitis, particularly those occurring through attacks of epilepsy; in exfoliative marginal glossitis, ulcerations of the gingival and buccal mucous membrane; in mercurial stomatitis, so called —and as a matter of fact in all inflammations of the mucous membrane of the mouth, particularly those of microbic genesis.

The solution Dr. Paranhos employs is as follows:

℞—Saturated aqueous solution of picric acid,	1 part;
Distilled water,	2 parts.

The solution is to be applied upon the ulcerated areas twice daily by means of a wad of cotton. The picric acid treatment should not be made to preclude the use of appropriate mouth-washes at suitable times.

PERISCOPE.

View the Cavity from the Left Side.—In preparing a cavity take a walk around to the left of the chair and view your work. It will perhaps look different from this aspect. P. St. C. Smith, *Dominion Dental Journal.*

To Remove Tin from Plates.—Small particles of tin adhering to vulcanite plates can easily be removed by mixing mercury with enough alloy to keep it from flowing, and rubbing it over the plate under fingers.—C. W. Siefkill, *Dental Brief.*

Soft Soldering.—All soldering operations require clean surfaces. Gold-plated German silver presents a clean surface for the solder, and further aids in securing a good union by forming an alloy with either tin or the lead solders.—*Dentist's Magazine.*

To Make Hard Plaster Casts.—Mix the plaster of Paris with one-sixth of its volume of pulverized slaked lime. After the cast is dried place it in a ten per cent. solution of zinc sulfate until it is thoroughly saturated. Remove and dry.—*Dental Era.*

Forms and Material for Clasps.—Clasps are made of either round or flat clasp gold. A good formula for clasp gold is pure gold twenty parts, pure copper two parts, and pure silver and platinum of each one part.—George H. Wilson, *Dental Summary.*

How to Cool Investment After Soldering.—After soldering, a uniform cooling is essential. The best and safest way is to bury the investment immediately in a can of plaster or marble dust, leaving it there to cool.—L. A. Neill, *Amer. Journ. of Dental Science.*

Annealing Platinum Matrix.—The platinum should be annealed at least three times. First, before using; second, after first burnishing; and third, preparatory to final treatment, which should consist only of packing spunk in the cavity. If any burnishing with instruments is attempted just prior to the final removal of the matrix it will be found that it will spring. This is especially true when dealing with compound cavities.—W. A. Piper, *Dominion Dental Journal.*

How to Direct the Flame While Soldering a Bridge.—Never attempt to solder a bridge by forcing the flame down into the hole, for it is one of the most difficult things to do. The more play and freedom the flame has, the better will be the results.—L. A. Neill, *Amer. Journ. of Dental Science.*

Round Burs in Cavity Preparation.—I cannot get along without round burs. I finish the cavity preparation with square-ended burs, fissure and inverted cones, but the major part of the cutting I do with round burs, principally because I can do it with a great deal less discomfort to the patient.—G. W. Dittmar, *Dental Review.*

To Keep Your Flasks Clean.—Place a small quantity of sodium bicarbonate in the vulcanizer before using, and you will be surprised how clean you can keep your flasks. They are readily and easily cleaned after such use. A pair of flask tongs will aid in keeping the hands clean, and one can handle the hot flasks to better advantage.—H. E. Davis, *Dental Review.*

A Coating for Plaster Casts.—Mix in four ounces of sulfuric ether, two ounces of collodion and two ounces of "silver gloss." (Obtained from dealers in painters' supplies.) Let it stand for about forty-eight hours and shake well before using. Keep in well-corked bottle. Apply with camel's-hair brush. Gives a beautiful glossy surface to casts.—J. F. Steele, *American Journal.*

Selecting Shades.—When we are studying a tooth for the purpose of selecting shades, the patient should be in an upright position. I have noticed that if the patient is placed in a reclining position so that the light strikes at an angle, the teeth seem much lighter than they really are. This study should be made early in the operation before the teeth have been allowed to dry, as drying always bleaches somewhat. In handling the shade guide we should remember that the body in an inlay will be much thinner than the specimen in the guide, and consequently much lighter; hence a darker color should be selected than is desired in the inlay.—J. O. Wells, *Dental Review.*

To Carry a Small Portion of Cement.—Take a very delicate broach, and either make a little ring at the end of the broach, or bend the point at an angle of 45° or 90°—just a little bend that you would almost have to use a magnifier to see—and you will find you can carry a little globule on the end of the broach. Otherwise it would tend to run back.—W. R. Barnes, *Dental Review.*

A Hint About Soldering.—Solder once flowed will not move as easily the second time, and, if attempted, is liable to take a part of the band with it. Soldering should always be finished at one point before leaving it, gradually shifting the position of the case so as to work toward the other end. Never start at both ends and finish in the middle.—L. A. Neill, *Amer. Journ. of Dental Science.*

To Prevent Saliva and Tooth-Polishing Powders from Working Back into the Handpiece.—One of the cup-shaped rubber disks used for polishing purposes, removed and placed on the shank of the instrument, obviates this difficulty; a ring of wire soldered on the shank will prevent the disk from working back toward the point of the instrument.—Chas. O. Kimball, *Internat. Dental Journal.*

Care of the Teeth During Pregnancy.—Paddock knows of nothing so efficacious in arresting decay of teeth at this time as milk of magnesia, lime-water, or a solution of sodium bicarbonate; a teaspoonful of the latter in a glass of water. One of these should be used as a mouth-wash after each meal and at bedtime, the remedial substance being thoroughly forced between the teeth.—*Medical Herald.*

Deaths During Scopolamin-Morphin Anesthesia.—When this mode of anesthesia was introduced into France, De Maurans called attention to the twelve cases in which death had occurred during the anesthesia, and for which the anesthetic was probably responsible. He now cites ten more fatal instances, and analyzes the reports of them published by various surgeons. His conclusion is to the effect that anyone "using this notoriously unreliable and dangerous technique incurs a heavy responsibility." Experimental research has confirmed the findings in the clinic. The method is merely the revival of the atropin-morphin technique, which was abandoned long ago, although atropin is a more staple product than scopolamin.—*Semaine Médicale.*

Protective for Porcelain During Soldering.—When circumstances make it necessary in near-by soldering, to invest crowns or bridges porcelain-face up, cover the porcelain with thin asbestos paper saturated with the investment mixture, catching the free ends in the body of the investment proper. The paper protects throughout the operation from the direct action of the flame.—*Dental Office and Laboratory.*

Shrinkage in Rubber During Vulcanizing.—The amount of shrinkage depends not only on the time the rubber is subjected to the process of vulcanization alone, but also upon the temperature. The lower the temperature and steam pressure, the less the loss in shrinkage, and the less the contraction in cooling. Low heat and time consumed also insures an improvement in the texture of the product.—George B. Snow, *Dental Brief.*

Root-Canal Treatment.—My final treatment of pulp-canals is as follows: The canal is flushed with campho-phénique in which thymol has been dissolved in the proportion of forty grains to the ounce. A gutta-percha point—fastened to the end of the root-plugger by heating the point and pressing it gently to the large end of the cone—is dipped into campho-phénique and then into iodoform powder, and forced to place in the canal.—J. Leon Williams, *Elliott's Quarterly.*

For Sore and Spongy Gums.—A useful mouth-wash is made with tincture of myrrh, a dram to a tumblerful of water; or tincture of iodin—two to four drams in eight ounces of water—with tannin. Bartholow employed a mouth-wash of one dram of tannic acid, two ounces of honey of rose, and four ounces of water. Davis recommends a weak solution of thymol, boric acid, or carbolic acid; also a weak galvanic current for seven to ten minutes through the parotid and salivary glands.—*Denver Medical Times.*

Treatment of Sensitive Palates Prior to the Taking of Plaster Impressions.—In prosthetic work, when your patient has a tender palate and is bothered with retching, to stay such trouble while taking an impression, paint on palate a twenty per cent. solution of potassium bromid with a camel's-hair brush, or gargle 5 to 15 gr., or both. In extreme cases give 10 gr. at night, repeat after breakfast, and again, half an hour before impression is taken, give 10 to 15 gr. It greatly diminishes the sensitivity of a tender palate.—H. E. Davis, *Dental Era.*

Bubbles in Porcelain.—I believe the reason I do not have bubbles is that in mixing the body I spatulate it with a great deal of force, mix and incorporate it thoroughly, grinding it down with a strong spatula, and when it comes to settling the body, settle it vigorously in one direction. So many when they have a crown or inlay upon a vise, or otherwise, will settle the body in one direction; then they will turn it over and unsettle it again, and rasp it up, changing the original settling of that body until—why shouldn't there be bubbles?—J. D. PATTERSON, *Western Dental Journal.*

To Etch the Surface of a Gold Inlay.—I have discovered a quick method to roughen the surface of a gold inlay without distorting it in any way. After the inlay has been completed and is ready to set, dip the part to which the cement is to adhere in mercury. Be sure that the surface is evenly coated. This may be accomplished by taking a pellet of moist cotton with a pair of pliers, and spreading the mercury around. Then invert over an alcohol flame and slowly drive off the mercury, leaving a rough, crystalline surface, to which the cement will adhere.—C. J. HADLEY, *Dental Review.*

An Effective Ligature.—In cases where the clamp is objectionable for the retention of the rubber dam, and where the ordinary floss is not sufficiently bulky to prevent the rubber from drawing over it, a most admirable method of using the ligature is to first pass the floss through two pieces of rubber tubing, allowing one piece on the buccal and one on the lingual side of the tooth. This is preferable to stringing beads on the ligature, or using other agents. The tubing should be the smallest size sold at the rubber stores, the kind used for slipping over the bows of glasses where they rest on the ears.—E. M. S. FERNANDEZ, *Dental Review.*

Treatment of the Gum Before Setting Crown.—When the gum has been wounded in grinding the root or in reducing the band to root-level, the acid of the cement works into the wound and gives rise to discomfort similar to that following the application of salt or vinegar. This of course subsides as the cement sets, but is anything but pleasant while it lasts. To overcome pain thus inadvertently induced, and to head off that which may attend the setting of the crown, I dry the root and adjoining gum and paint them with chloropercha. The effect is immediate and the discomfort hardly worthy of mention.—J. C. EDINGTON, *Dental Office and Laboratory.*

Potassium Permanganate as a Hemostatic.—Schädel refers to the use of potassium permanganate as a valuable hemostatic agent. It should be employed in the form of a paste, made by mixing it with four per cent. of vaselin. The part to which it is to be applied should first of all be thoroughly dried. It is of service in epistaxis and in the bleeding which results from the excision of warts and condylomata. Its application is only slightly painful. The preparation, when not in use, should be kept in an air-tight dish, as exposure to air deteriorates it to some extent.—*Deutsche med. Wochenschrift.*

A New Solvent for Gold.—The author finds that gold leaf dissolves fairly readily when floated on an acid solution of ordinary thiocarbamid. The action is rapid when a suitable oxidizing agent is added: for example, when a solution of thiocarbamid is acidified and treated with a little ferric chlorid, potassium dichromate, or hydrogen dioxid, the mixture dissolves gold leaf after less than a minute's shaking. The solution is not precipitated either by ferrous sulfate or by stannous chlorid (except after long standing), whence it follows that the gold is present in solution as part of a complex ion. The gold compound has been isolated in brilliant colorless, six-sided lozenges, striated parallel to the longest axis, and is identical with a compound which the author has obtained by boiling a mixture of sodium aurichlorid and thiocarbamid solutions.—JAMES MOIR, *British Dental Journal.*

Water as a Local Anesthetic.—J. A. Wyeth has become convinced that the Schleich method of anesthesia by the infiltration of weak cocain solutions is due more to the fluid itself than the contained salt. He gives the history of two cases, both men having small tumors on the back. In both, removal was painlessly done under water anesthesia, which acts by pressure on the end organs of the sensory nerves, destroying their sensitivity. Ten minims of sterile water were used, the needle resting in the substance of the skin and not below it. This procedure was repeated in the same continued linear direction until a sufficient length of anesthetized skin was produced. The needle was then thrust between the capsule of the tumor and the subcutaneous aureolar tissue, and the water freely injected so as to lift the skin from the tumors, which were separated also by a similar manipulation from the underlying connective tissue.—*New York Med. Journal.*

To Electro-Gild Orthodontia Appliances.—Make a solution by dissolving ammonium carbonate and potassium cyanid, one ounce of each, in one pint of rain-water. Attach the appliance to the zinc pole, and a piece of pure gold to the carbon pole of any form of cell battery. Place the solution in a porcelain pan over a low flame, allowing it to boil slowly. Keep the appliance and gold in the solution from ten to fifteen minutes. The appliance will come out with a dark brown color, but after brushing it with a stiff brush filled with sodium bicarbonate, it will have a rich gold color.—J. Q. BYRAM, *Dental Review.*

Local Treatment of Pyorrhea Alveolaris.—The treatment is surgical. First pass a flexible steel blunt-pointed needle to the bottom of the pocket, flooding the same with a local anesthetic solution; then commence to remove the pyorrheal deposits, confining yourself to one tooth until this is accomplished. After all deposits are removed, flood the pocket with C. P. lactic acid warmed. Now let the tooth alone, giving it absolute rest, and in two or three weeks your case will be well. If a tooth is loose it should be banded with thin platinum or ligated with No. 3 sewing silk to hold it firmly. Instruct the patient to massage the gum night and morning with powdered sulfur.—ROBERT GOOD, *Dominion Dental Journal.*

Some Ideas I Have Found to be a Help in Practice.—In soldering up a crown or bridge, I find a common lead pencil a fine tool for teasing the solder to flow just where I want it. I prepare the pencil for the work as follows: Sharpen pencil as for ordinary use, only making a longer slant to the point; then cut the wood back, exposing the lead for about one-half inch from the point. Saturate the wood for about an inch up the shaft of the pencil with diluted sulfuric acid. Then wrap lower part of shaft with strip of asbestos paper down to exposure of the lead, and bind with wire thread. This helps to resist action of heat from blowpipe. It makes a light, cool, and satisfactory tool that does the work much better than platinum, and it does not drag the solder as an over-heated platinum point is apt to do.—W. H. SPAULDING, *Dental Summary.*

Two Methods of Making Clasps.—There are two methods of adapting clasps: First, the clasp is formed by means of pliers to approximately a close adaptation, so that it will be uniformly supported, but not so close but that the fluids of the mouth can pass freely between metal and tooth. Second, a piece of thin pure gold or platinum No. 36 gage is accurately fitted to the tooth, a strip of clasp metal is then adjusted as closely as possible with pliers to the burnished metal, and the two united with wax; they are then sprung away from the tooth, invested, and thoroughly soldered together. It is possible with this perfect adaptation of the clasp to the tooth—the secretions being retained by capillary attraction and not changed by the fluids circulating in the mouth—that disintegration may be invited; but with proper cleansing and removing the denture at night there will rarely be any ill effects.—GEORGE H. WILSON, *Dental Summary.*

Treatment of Odontalgia by the Medical Practitioner.—H. B. Ray gives the following advice on the treatment of toothache by the medical practitioner: Toothache is essentially an inflammatory condition, and in ninety-nine per cent. of the cases there is a cavity in the affected tooth. In those cases where there is a cavity, but no nerve exposure, the treatment is to simply apply a sedative and exclude the secretions of the mouth from the cavity, when prompt relief will follow; then advise the patient to visit a competent dentist. A very effective agent, and one always on hand, is the oil of cloves. It should be applied by saturating a pledget of cotton with the remedy, and introducing it into the cavity with a toothpick or other pointed instrument; this being done, the secretions are kept out by filling the cavity with a little beeswax—a household remedy always at hand. The wax can be applied by warming it over a lamp on the point of a knife, and then forcing it into the cavity. The wax filling not only serves the purpose of keeping the secretions of the mouth out, but prevents thermal changes from affecting the pulp when hot and cold things are taken into the mouth.—*Monthly Cyclopedia of Pract. Medicine.*

Backing Facings and Gold Corners on Porcelain Teeth.—After selecting facing of the right color, size, and shape, I cut the backing of 30-gage crown gold and burnish it to the tooth or facing. I do not grind the cutting edge, because by so doing we lose cutting-edge strength. I remove the backing and flow solder over the lower part of it. I also cut the pins off, instead of bending the pins down to the backing, as that is another reason for fractures. After the tip of the backing has been soldered, the backing is replaced on the tooth and the tooth waxed to place on the model, the tip of the facing covered with investment, and there is no danger of solder running over on the porcelain facing and doing damage. The parts are then united by solder in the usual way.

In order to place a gold filling or corner on a porcelain tooth grind off a corner of the tooth and burnish the backing over corner; remove, invest, and solder on the gold tip or corner. Polish and replace on the tooth again. By this method one can make a gold corner on a plate-tooth without the use of the diamond drill. Such a display of gold of course should be used only in exceptional cases, as for instance, in a mouth where one or two teeth are to be supplied among a number of others already contoured with gold.—L. A. STEMMLER, *Items of Interest.*

Amalgam Inlays.—The principle upon which inlays are inserted is good. I insert both gold and porcelain inlays, and there are times when amalgam is indicated, as Dr. Ottolengui says, "not for cheapness, but because it ought to be used in some particular cases." Amalgam can be inserted on the inlay method, which will be found extremely useful where it is difficult to give the cavity a retentive form on account of undue loss of tooth-substance, and where in order to obtain anchorage, the pulp would be encroached upon, or the tooth weakened. After preparing the cavity and thoroughly drying it, I prepare the amalgam. I now mix some cement (slow-setting preferred) and smear over floor and walls of cavity, not very deep. Then a piece of amalgam is placed in position, and carefully but quickly pressed into place. If the amalgam has been squeezed pretty dry previous to use, it will press out the excess cement, which should be wiped off. More amalgam is added until the desired contour is obtained, when filling is finished in the usual way. These fillings are held as firmly as are inlays, by a thin film of cement —which serves the purpose of mechanical retention, preventing recurrence of decay and acting as a non-conducting lining—which tends to prevent thermal shock.—W. H. REABEN, *Dental Review.*

Fractured Upper Molars.—The fracture of upper molars through the bifurcation occurs usually in pulpless teeth where the cusps are prominent and the teeth are used with much force, and where the buccal and lingual margins of the filling have not been laid well to the crests of the cusps.

In treating these cases, first pass a wire around the tooth and twist the ends tightly together, as in measuring a root for a band. For this purpose use annealed German silver wire, gage 24, but in an emergency ordinary binding wire may be used, wrapping it around the tooth several times. A strong clamp placed on the tooth will also assist materially. With the parts thus firmly bound together, grind down the cusps, and remove the filling. Then with an 0.8 mm. inverted cone-bur, cut a groove in the mesio-buccal angle, starting at the entrance to the mesio-buccal canal and drawing it occlusally. A similar groove is cut in the disto-buccal angle. The entrance to the lingual canal is then enlarged, and a groove cut toward the mesio- and disto-lingual angles, making a dovetail in each fragment. Carefully fill the cavity with amalgam. The patient is now dismissed with the wire ligature still in place, and cautioned not to use the tooth until the next morning. At a subsequent sitting the ligature is removed, and the tooth prepared for a crown. It can be ground freely and the enamel cleavers used with force, without danger of disturbing the fragments. A properly fitted gold crown eliminates all danger of future disturbance.—JAMES W. BIRKLAND, *Northwestern Dental Journal.*

Plastic Reconstruction of the Mandible.—Carl Beck, Chicago (*Journal A.M.A.*, April 21), reports a case in which the mandible had been removed completely from one joint to the other, leaving only a few shreds of periosteum and a few spiculæ of bone. The patient, a woman, had been under the treatment of a skilful dentist, who had endeavored to hinge a plate to the maxilla, but without success, and her condition was very unsatisfactory. When she came into Dr. Beck's hands he first thought of trying Dr. Claude Martin's method of restoring the cavity in which the jaw had lain and forcing the plate devised by Martin into the new cavity. The danger of septic infection seemed to be so great, however, and the patient's health so poor, that he decided to try another method, and finding some small spiculæ of bone some one inch in length within the scarred tissue, he thought hard paraffin might form a good support for the soft tissues and, if tolerated, would ultimately allow restoration of the original shape of the mandible. He began with an injection of a small quantity into the deepest portion in front of the ear. Finding this well borne, he became bolder and injected larger quantities first on one side, then into the center, and gradually to the whole extent of the missing mandible. Improvement followed each injection. The offensive odor disappeared, speech became normal and the patient resumed her work as a teacher. The results after several months are still good, and Beck thinks that he can make up for any possible shrinkage by future injections if necessary. After a time an attempt will be made to form a ridge in the mouth upon which to fit a plate. He criticizes the surgeon for the extensive operation and for not attempting an immediate prosthesis.—H. A. I., *Lancet-Clinic.*

How to Prevent Bubbles in Porcelain.—It has often been asked, "Why do we have bubbles in porcelain?" Especially in crown and bridges is it common to find, when bringing the work to a "glaze," that the piece is more or less a mass of bubbles. There may be several causes for this. The porcelain should be well spatulated before introducing it to the work, and then thoroughly jarred to place. It is common for us to use too much water. The first portion of porcelain introduced should be a little damper than the remainder, as it is necessary that it should penetrate into every crevice. After this it should be worked much dryer, and jarred until every bit of the moisture possible comes to the surface. The porcelain is settling just so long as the moisture appears on vibrating the work. If this is not properly done we have, when the moisture is evaporated, an air-space, which means an air-bubble in the finished work. Placing damp work in a hot furnace is another cause for trouble. If the porcelain is not thrown off entirely it may be dislodged sufficiently to form a bubble, or possibly a fissure, which will be almost impossible to refill later. How often we hear the statement that the volatilization of pure gold is the cause of bubbles. I believe this theory is positively groundless; I base this statement upon the results of many experiments. The reason why we have so many bubbles in bridge work is on account of using too large quantities of porcelain at one time over a rigid framework. The first bake should never cover the pins or even touch them; if it does, on shrinking it leaves an air-space beneath, which later means a bubble. Apply and bake several times until the framework is covered, bringing to a low glaze each time. Using these precautions, you will have a porcelain free from bubbles whether you use a large or small quantity of gold.—A. W. Starbuck, *Western Dental Journal.*

HINTS, QUERIES, AND COMMENTS.

A CASE OF REPLANTATION.

The following method of treating an inaccessible cavity in a posterior molar, while not new or original with the writer, deviates so markedly from the ordinary methods of procedure that we believe its description will not prove wholly uninteresting.

Having been called upon to treat a cervico-gingival cavity in an upper right second molar, the pulp of which was exposed, and finding that proper treatment could not be carried out because of the inaccessibility of the tooth and cavity, I proceeded as follows:

I extracted the tooth, wrapped the root with iodoform gauze, removed the pulp, filled the root-canals, placed an amalgam filling in the cavity, and replanted the tooth. At no time throughout the operation was the root exposed, either to the action of antiseptic fluids or to such sources of contamination as the fingers, instruments, etc. Four days after the replantation all soreness had disappeared, and the tooth seemed as solid in its alveolus as ever.

F. W. Traylor.

Boonville, Ind.

A METHOD OF REMOVING BROKEN PIVOTS FROM ROOT-CANALS.

I have read a number of suggestions regarding the removal of broken pins of Logan crowns from root-canals, but am not aware that the present method has been previously published. I take a rose-head bur, follow the pin, and cut it out instead of the hard tissues round it. Platinum pins are soft, and I find no difficulty in cutting them out. I have never had any difficulty whatever in drilling a pin out, regardless of its length or of the nature of the root-canal.

B. B. Detwiler.

Herndon, Va.

OBITUARY.

DR. WARREN DE CROW.

Died, of accidental injuries at San José, Cal., Warren De Crow, D.D.S., in the sixty-sixth year of his age.

Dr. Warren De Crow met his death in the earthquake of April 18th. The building in which he had both his residence and office collapsed, and the indications are that death was instantaneous.

Warren De Crow was born in Licking county, Ohio, February 17, 1841. In the early part of 1863 he entered the office of Dr. MacBrian, a practitioner of dentistry in Newark, Ohio, and after three years' instruction entered upon the practice of his chosen profession in Quincy, Ill. He became a member of the Illinois State Dental Society in 1868, and remained an active member thereof until his removal to California. After seventeen years of practice in Quincy, his health gave out so completely that he closed his office for the last time, as he felt, and moved to California. However, it took but a few months in the invigorating air of that healthy region to allow him to take up again the duties of a dental practice. He practiced for two years in Hollister, San Benito county, and in 1884 again changed his residence, this time moving to San José.

Since 1885, the date of his entering the California Dental Society as an active member, he has held several offices of trust and responsibility in that organization, among them that of vice-president and shortly afterward that of president. He helped to organize the Santa Clara Valley Dental Association, and was its first president. Because of his long experience and wise judgment in matters pertaining not only to his profession but also to worldly activities of varied nature, he has been looked upon as the father of the society which he founded, and his death has caused among his colleagues a vacancy which they feel is most difficult, if not totally impossible, to fill.

Dr. De Crow's entire life has been devoted to his profession, as he found his greatest pleasure in working for the advancement of dentistry. All new ideas and novelties in appliances he investigated eagerly, and as he was most lavish in the purchasing of materials and instruments, he has left an outfit representative of the newest and oldest in dental instrumentation. He was a thorough, progressive, and most successful practitioner, and those whose fortune it was to be under his care realized that they were the recipients of the best professional services obtainable. He was an acknowledged leader in the new things of dentistry, always working ahead of the times. When porcelain finally became a popular filling material it found him well experienced in its properties and possibilities.

In 1863 Dr. De Crow married Miss Harriet C. Stone, of his native county, who survives him, having been rescued from the midst of the collapsed building with nothing more serious than bruises, although she was pinned in the ruins for three hours.

DR. WILLIS PERRY BURT.

Died, at his home in Atlanta, Ga., June 25, 1906, of heart failure, Willis Perry Burt, in the sixty-fifth year of his age.

Dr. Burt was born in Chambers county, Ala., September 6, 1842. In 1861 he enlisted as a private in the famous Forty-second Georgia Regiment, Confederate States Army, and served with it bravely until the close of the war. He was engaged in the defense of Atlanta in 1864, and his diary and poems written during that period are of historical and literary value.

Immediately after the war he began to study dentistry, attending the Baltimore College of Dental Surgery in 1868. Immediately thereafter he commenced practice in Americus, Ga., continuing there until 1896, when he removed to Atlanta, and established himself firmly in professional work, being so engaged up to within a few days of his death.

Dr. Burt was a man of more than ordinary intelligence, and was a deep reader and well versed on almost any topic. He is the author of many beautiful poems, which have been published in the leading newspapers and periodicals of the South from time to time during the last forty years.

Just two weeks before his death, on invitation of the Daughters of the Confederacy, he delivered a memorial address on Jefferson Davis, at his old home in Americus, Ga., receiving a great ovation. The opening words of his oration are worthy of record:

"The thoughts that germ in human minds
Are fickle as the shifting winds;
No force to drive, wireless and free
They wing their way o'er land and sea.
The glance of hate, affection's dart,
Flash eye to eye, pulse heart to heart."

Dr. Burt was a loyal member of Camp No. 159, United Confederate Veterans, and was buried with military honors.

"IN MEMORIAM" RESOLUTIONS.

DR. CHARLES C. CHITTENDEN.

IN respect to the memory of Dr. Chas. C. Chittenden, the Southern Wisconsin Dental Association at their annual meeting, May 31, 1906, adopted the following resolutions:

Whereas, The hand of Providence has removed from us our honored member and active co-worker Dr. Charles C. Chittenden; and

Whereas, In his decease we have suffered the loss of a member who had an active interest in this society, and who had the welfare of the entire profession at heart; therefore be it

RESOLVED, That we, the members of the Southern Wisconsin Dental Association, in annual session in Milwaukee this 31st day of May 1906, express to the members of his bereaved family our sympathy and sorrow in their affliction, and assure them of our admiration for his high personal and professional qualities; and be it further

RESOLVED, That these resolutions be spread upon the records of this Association, a copy sent to the family of our departed member, and copies sent to the dental journals for publication.

E. J. HART,
P. B. WRIGHT,
CHAS. L. BABCOCK,
Committee.

DR. CHARLES S. BECK.

THE Luzerne and Lackawanna Dental Society, at a regular meeting held at Wilkesbarre, Pa., March 27, 1906, passed the following resolutions:

RESOLVED, That whereas our old and kindly friend Dr. Charles S. Beck has been taken from us by the decree of an unerring God, and inasmuch as we deeply deplore his removal, together with the prospect of his absence from our meetings both social and professional, the conviction is forced upon us that in his demise a noble soul has gone hence.

Many positions of trust have been filled by Dr. Beck, and many honors came to him as a reward for work well done. His whole life was a struggle for the best for his profession, and his belief in the nobility and usefulness of the work in which he was engaged should be a lasting inspiration to us all.

To his sorrowing family we send every assurance of our respect and our deep sense of the great loss sustained.

H. N. YOUNG,
R. M. STRATTON,
D. B. WILLIAMS,
Committee.

DENTAL COLLEGE COMMENCEMENTS.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL.

At the annual commencement exercises of the Northwestern University Dental School the degree of Doctor of Dental Surgery was conferred on the following graduates:

Gustav Theodore Alm	Michigan
Robert G. Anderson	Iowa
Edward Holbrook Ashley	Illinois
Owen Seward Barke	Minnesota
Chas. Lisle Barnett	Washington
Torrence Dawson Barnett	Ohio
Walter J. Baumgartner	Iowa
Herbert Floyd Best	Montana
Walter Lee Bible	Wisconsin
Roley Bovik	Illinois
Chas. Arthur Cardy,	Illinois
Charles Milton Case	Illinois
John Fred'k Christianson	Utah
Jas. Wm. Christopher	Australia
Ira Enis Close	Illinois
Wilber Roscoe Conklin	Illinois
Elisha John Crary	Iowa
Walter Forest Crook	Iowa
Wm. Henry Davis	Illinois
Edw. Jos. Donahue	Michigan
Alfred Erickson	Illinois
Clarence Walter Erwin	Oregon
Zackary Daniel Ford	Tennessee
Thos. Wesley Fox	Missouri
Jos. Peter Frey	Iowa
Howard John Furby	Washington
Henry Levant Galbraith	Minnesota
Robt. H. Gatewood	Nebraska
Harry Logan Geary	California
Bert Bennett Giffen	Wisconsin
Wm. Franklin Gilbert	Wisconsin
Richard Gruenblatt	Austria
Oscar Walter Hanson	South Dakota
Geo. Edward Haynie	Missouri
Harry Lowell Holmes,	Iowa
Frank Russell Humber	British Columbia
George D. Joannidi	Turkey
Frederick Wm. Kiel	Australia
William David Lamley	Michigan
Fred'k S. Lawson	Wisconsin
Chas. Philip Lieberthal	Ohio
Wm. Light	Illinois
John Osmer Lowe	Idaho
Henry Edw. Lyons	Illinois
Thos. Jefferson McCracken	Oregon
Wm. Harvey McKibben	Illinois
Thos. R. McNerthney	Washington
Agnes Mann	Germany
Robt. J. Mercer	South Dakota
Verne Agassiz Miller	Indiana
Joseph Francis Mohan	Illinois
Osmond Stanley Moore	Australia
Jas. Edw. Murray	Colorado
Arthur Glen Nelson	Illinois
Robert Adam Ogilvie	North Dakota
Wm. Andrew Olson	Minnesota
Elsworth S. Park	Texas
Benj. Sherwin Partridge	Illinois
Lyulph Peach	Australia
Wm. Shirley Peisley	Australia
Lewis Arthur Pelton	Illinois
Clifford Plew	Indiana
Geo. Robt. Puffer	Illinois
Don Quincy Rathbone	Montana
Ernest H. Redeman	Wisconsin
George Ford Reynolds	Indiana
Colonel Melzar Richards	New York
Walter Harold Richards	Iowa
Francis Leo Russell	Illinois
Joy Clarence Sawyer	Michigan
Emil Albert Schmuck	Illinois
Geo. M. Schroeder	Iowa
Earnest Linwood Scobee	Minnesota
Chas. P. Seabert	Iowa
Chas. Luther Searl	Illinois
Wm. John Sengpiel	Wisconsin
John Edgar Sheffield	Ohio
Thos. Eaton Shuford	Mississippi
Samuel Sherman Spicer	Iowa
Earl Glenwood Stephens	Illinois
Arlon Vernon Strauss	Iowa
Walter E. Teitgen	Wisconsin
John Lamb Thompson	Oregon
Ray Frank Topliff	Iowa
Earl Carlton Tyler	Michigan
Isador Unger	Illinois
Eivin Vinje	Minnesota
Fred Theodore Weeks	Wisconsin
Chas. Nicholas Weyer	Minnesota
David Nichol White	Utah
Glenn Bernard Whitney	Michigan
A. Francis Wilbur	Washington
Grant W. Williams	Nebraska
Eugene Vernon Wood	Tennessee
Nathaniel Clark Wood	Indian Ter.
Weston Wilmot Wright	Canada

UNIVERSITY OF MINNESOTA, COLLEGE OF DENTISTRY.

THE thirty-fourth annual commencement exercises of the University of Minnesota, College of Dentistry, were held June 14, 1906, at the University Armory, Minneapolis, Minn.

An address was delivered by Harry Pratt Judson, LL.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Frederick Arthur Amundson
Carl Ernfried Anderson
Harry J. Baker
Harvey Dwight Barnett
Oscar Bjorge
Adolph Leonard Blix
Louis Dale Blondel
Ernest Wm. F. Boerner
Wayne Bliss Corser
Stephen R. Fortier
Marcus Frederickson
Ula Emil Heddy
Walter Sandberg Huntington
William Richard Jung
Edward Henry Jungclaus
Kaare Kaasen
Ernest Clayton Kendall
Louis William Korfhage
James Thomas Layne
Alexander Cameron Lestico
Emil Hjalmar Lier
Robert Victor Malmgren
Merton R. Melvin
William Basil Morstain
George Andrew Nelson
Verner Hjalmar Nilsson
Carlton Percy Olsen
Claus Alvin Rollin
Arthur Taylor Rowe
Carlus Selvig
Walter Herbert Smith
Stephen Howard Spurr
Howard W. Thomas
Joseph Leo Tomasek
George Chester Turner
Isador John Wahlstrom
Charles Edgar Waiste
R. Mortimer Weaver
Amos Schumpert Wells
Conrad Peter Winther
Leslie Maley Woodbury

DETROIT COLLEGE OF MEDICINE, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of the Detroit College of Medicine were held at the Detroit Opera House, Thursday evening, June 7, 1906.

An address was delivered by Dr. H. W. Heasley, and the valedictorian was O. L. Brooks, D.D.S.

The degree of Doctor of Dental Surgery was conferred by the president, Sidney T. Miller, on the following graduates:

R. G. Anderson
O. L. Brooks
G. Brower
J. D. Compton
H. W. Davis
W. H. Goodship
A. J. Kennedy
R. N. Kreuter
S. Leonard
R. C. McMurray
F. H. Miller
H. L. Pearsall
W. F. Roche
W. P. Shelton
R. P. Southwood
R. K. Stewart
M. H. Tompkins
G. L. Watkins
R. E. Watkins
S. Wesolowski
P. E. Winslow

GEORGE WASHINGTON UNIVERSITY, DEPARTMENT OF DENTISTRY.

THE annual commencement exercises of the Department of Dentistry, George Washington University, were held Wednesday, June 6, 1906, in Memorial Continental Hall, Washington, D. C.

An address was delivered by Rev. Denis J. Stafford, D.D.

The degree of Doctor of Dental Surgery was conferred by the president, Chas. W. Needham, LL.D., on the following graduates:

Adolphus Blair Ake	Pennsylvania
Roy Clay Brittin	Tennessee
Nathaniel Chapman	Dist. of Columbia
Ralph Stuart Clinton	New York
Marion Edwyn Harrison	Georgia
Upton S. Houser	Maryland
Don Francis Murphy	Dist. of Columbia
Frank Elton Neely	Indiana
James T. Prendergast	West Virginia
John Winslow Taylor	Maryland
Ralph Ivey Vandewall	Wisconsin
William Henry Woodruff	New York

UNIVERSITY OF MICHIGAN, COLLEGE OF DENTAL SURGERY.

THE sixty-second annual commencement exercises of the College of Dental Surgery, University of Michigan, were held at Ann Arbor, June 21, 1906.

The commencement oration was delivered by Bliss Perry, L.H.D., Litt.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Frank Alanson Benedict
Clinton Cyrus Davis
William Marshall Dow
Frank Ellis Dunster
Albert John Hall
Herbert Hutchinson Harper
Joseph Scott Hawley
Clyde Peck Hendricks
Walter Gilbert Kinyon
John Daniel Lafayette
Morris Davis Mackoy
Chester Field Miller
Arthur Eugene Ramsdell
Charles Joseph Reilly
Charles William Ringler
Charles Verne Smith
Ted Ray Southard
Edward Cramon Stanton
Leslie Earl Stiles
James Hume Taylor
Robert Herman Vollmayer

STATE UNIVERSITY OF IOWA, COLLEGE OF DENTISTRY.

THE twenty-fourth annual commencement exercises of the College of Dentistry, State University of Iowa, were held in the university armory, Iowa City, Wednesday June 13, 1906.

An address was delivered by Hon. Clarence Don Clark.

The degree of Doctor of Dental Surgery was conferred by the president, Geo. E. MacLean, on the following graduates:

Mark D. Brown	South Dakota
Bert Lee Christie	Iowa
Frederic Trenk Daly	Iowa
Robert Enoch Damon	Iowa
Jacob Anderson Farlien	Iowa
Harry Emmons Gibbs	Iowa
Charles Sidney Horel	Iowa
Fred Lee Humeston	Iowa
Karl Wilson Knapp	Iowa
Louis Frederick Kruger	Iowa
Rush Clark Lahman	Iowa
Clarence Sylvester Lister	Iowa
Arthur John Moravec	Iowa
Charles Burton Payne	Iowa
Emory Jesse Schultz	Iowa
Frederick William Schwin	Iowa
John William Scovel	Iowa
Ansel Reuben Settell	Iowa
Julius Frederick Tilden	Iowa
Jesse Ward	Illinois

NORTH PACIFIC DENTAL COLLEGE.

THE annual commencement exercises of North Pacific Dental College were held Friday evening, June 1, 1906, at Heilig Theater, Portland, Ore.

The annual address was delivered by Dr. Harry Lane, and the valedictory by Benj. Franklin Rambo, D.M.D.

The degree of Doctor of Dental Medicine was conferred by Dr. Herbert C. Miller, president of the college, on the following graduates:

Ammon Morten Davis
Fred Raymond Davis
Samuel Joseph Davis
J. R. Gerald Deyell
Henry Cline Fixott
Frank LeNoir Fleehart
Albert Earl Gibson
James Robert Gilchrist
Howard Gove
William Arthur G. Handford
Charles William Hanson
Carl Marquis Harrison
Harold Jackson
Elvin V. Jefferson
Ernest Albert Keepings
George Henry Martin
Clay Perez Mason
Elmon Hall Miller
Nelson Morrison
Clyde Mount
Archibald Dudley Perkins
James Clarence Price
Carleton Ara Proudfoot
Benjamin Franklin Rambo
William Ricen
Edward Mathias Senn
John Dennis Sheehan
Seymour Sperry Skiff
Albert Stratton
John Claude Swan
Josephus Cecil Tamiesie
Carl Milton Williams
Charles Winters, Jr.

NEW YORK COLLEGE OF DENTISTRY.

The fortieth annual commencement exercises of the New York College of Dentistry were held in Carnegie Hall, New York city, Monday, June 4, 1906.

The address to the graduates was delivered by Rev. John Wesley Hill, D.D., and the valedictory by Albert Henry Stevenson, D.D.S.

The degree of Doctor of Dental Surgery was conferred by Rev. George Alexander, D.D., president of the board of trustees and directors, on the following graduates:

Louis Norman Agatston	New York
Harry David Aszernoff	New York
Harris Bellick	New York
Louis Edward Bieber	New York
Charles Chester Bronstein	New York
Jno. C. Frederick Debrot	New York
Siegmund Alexander Dober	New York
Lester Joseph DuBrul	New York
Harry Prescott Evans	New York
Howard Maxwell Failing	New York
Bernard Fischler	New York
Morris Fuchs	New York
George Glassberg	New York
Louis Glucksman	New York
Solomon Sidney Gross	New York
William Henry Gutelius, Jr.	New York
Sigmund Harris	New York
Edward Roosevelt Hopper	New Jersey
Harry Hyman	New York
Harry Kaufman	New Jersey
Edmund Samuel Needles	New York
Samuel Charles Newman	New York
Clarence John Penney, B.A.	New York
Isaac Pollock	New Jersey
Valerian Nicholas Quintin	New York
Abraham Hallsworth Rosenbaum	New York
Bernard Rosenberg	New York
Samuel Seymour Rosenberg	New York
Harry Rozovsky	New York
Henry Schwamm	New York
Simon Shapiro	New York
Albert Henry Stevenson	New York
Paul Sigmund Tarler	New York
John Brownhill Thomson	New York
Earl Timeson	New York
Ralph Waldron	New Jersey
John Russell Watson	New York
George Edward Weaver	New York
William Russell Weaver	New York
Robert Weiner, M.D.	New York
James Wilenkin	New York

WESTERN RESERVE UNIVERSITY, DENTAL SCHOOL.

The thirteenth annual commencement exercises of the Dental School, Western Reserve University, were held in the Beckwith Church, Cleveland, Ohio, Thursday, June 14, 1906.

An address was delivered by the Hon. David J. Brewer.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Louis Albert Arosemena
Ralph Raymond Bevard
Howard Emery De Wees
Earl Pearson Jones
John Charles Kline
Walter Amos Loope
William Anson Maloney
Benjamin Thomas Maltby
Henry Edwin Moffet
Bert Byron Pontius
Frederick Rieske
Bert Alvin Shriber
Henry Frederick Smith

MEDICO-CHIRURGICAL COLLEGE, DENTAL DEPARTMENT.

At the annual commencement exercises of the Medico-Chirurgical College, Dental Department, the degree of Doctor of Dental Surgery was conferred on the following graduates:

J. C. Bechtel
W. Buchanan
W. A. Cooney
J. H. Dowling
W. G. Dusto
F. J. French
J. W. Howell
W. M. Lennox
S. F. Ludlow
V. A. McHenry
H. Morris
J. F. Powers
A. H. Staples
R. C. Watley
H. M. Wilkinson

UNIVERSITY OF BUFFALO, DENTAL DEPARTMENT.

At the annual commencement exercises of the University of Buffalo, Dental Department, the degree of Doctor of Dental Surgery was conferred on the following graduates:

Howard Bow Beach
John Frederick Box
Lewis Edwin Brockett
Edward Henry Cantwell
Carlos Duane Chase
Lowell Childs
John Conrad Christenson
Guy Harold Cole
Lee Hamilton Cotton
Francis Thomas Decot
Joseph Abraham Dixon
John Wesley Dowd
James Brayton Durrant
Leo Sinclair Eschelman
Elton Albert Foote
Francis James Frantz
John Hogan
Roy Jones Holcombe
Alton Henry Hollister
John Edward Hubbard
Charles Martin Klipfel
Arthur Wesley Kohler
John William Lent
Irving Efner Maul
Henry Wellington Mitchell
Sidney Henry Moore
Arnold Richardson Moyer
Michael Edward O'Brien
Charles Francis Redner
Harry Elihu Rice
George William Slorah
Clarence Thorn Van Woert
Harold Kirk Wheeler
Daniel Francis Zahm

HOWARD UNIVERSITY, DENTAL DEPARTMENT.

At the annual commencement exercises of the Howard University the degree of Doctor of Dental Surgery was conferred on the following graduates:

Roscoe C. Brown	Washington, D. C.
Geo. W. Coffey	Florence, Ala.
David D. Foote	Vicksburg, Miss.
Joseph N. Fox	British Guiana.
Benjamin M. Grant	Darien, Ga.
Charles H. Gray	Cleveland, Ohio.
Simeon O. G. Johnson	Jamaica, B. W. I.
Sidney C. E. Muirhead	Mandeville, B. W. I.
Charles Payne	Barbadoes, B. W. I.
John Pinheiro	Georgetown, B. G
Elijah V. Watkins	Washington, D. C.

MEDICAL COLLEGE OF VIRGINIA, DENTAL DEPARTMENT.

The annual commencement exercises of the Medical College of Virginia, Dental Department, were held May 15, 1906, at Richmond, Va.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Clem Luck Dickens
James Overton Hart
Frank Brooke Longan
Leo Davis Printz
Richard Irving Stitch.

PITTSBURG DENTAL COLLEGE.

At the annual commencement exercises of the Pittsburg Dental College the degree of Doctor of Dental Surgery was conferred on the following graduates:

J. Byron Ache
Carl T Anthony
Bruce Wallace Bedford
Willis H Beebe
James L. Buchanan
Ray Morris Clovis
John Howard Conrad
Joseph R. Cottom
Frank Hoover Dougherty
Jas. E. Dowden
John G. Fitzhugh
Edmond P. Heath
John C. Hipple
J. Glen Humphrey
Benjamin F. Jenkins
Arthur W. Kennedy
Guy Latshaw
Curt F. Leidenroth
Frederick R. LeVier
K. N. McAlpin
William B. McKee
Walter G. Mack
R. Banks Pearce
Orlo C. Schlag
Luther E. Shull
Thomas H. Smith
Harold C. Stevenson
E. Earl Wenrick

HARVARD UNIVERSITY DENTAL SCHOOL.

At the annual commencement exercises of Harvard University Dental School the degree of Doctor of Dental Medicine was conferred on the following graduates:

Horatio Le Seur Andrews
Francis Leonard Aubrey
William Henry Baker
Howard Watson Baldwin
Fred Alexander Beckford
Willem Matthias van den Broek
Percie Chater Charlton
Howard Clapp
Robert Glendinning Collins
Arthur Sylvester Crowley
Alban Berchmans Chrysostome Descroix
Roland Edward Desoe
Joseph Elisha Farnum
William Henry Gilpatrick
Merton Henry Greene
Thomas Peckham Ernest Greene
John Edward Hassett
Robert Hope
Meritt Jenkins
Herman Eli Kahn
Thomas Nicholas Lanigan
Edward Henry Loomer
Cornelius Henry Mack
Frank Thomas Murray
John Gilchrist Niles
Harold Bradshaw Norwood
Maurice Earle Peters
William Dawbney Riggs
Judson Clarence Slack
William Fiske Strangman
Arthur Garfield Webster
Willis Henry Weinz
Ernest Victor Leon Whitechurch
Fred Sumner Woods

GEORGETOWN UNIVERSITY, DENTAL DEPARTMENT.

The annual commencement exercises of the Dental Department of Georgetown University were held Tuesday, June 12, 1906, in Georgetown College, Washington, D. C.

An address to the graduates was delivered by Prof. Samuel S. Adams, A.B., A.M., M.D., and the valedictorian was Festus Joseph Nee, D.D.S.

The degree of Doctor of Dental Surgery was conferred by Rev. David Hillhouse Buel, S. J., on the following graduates:

John Kennedy Duncan	Iowa
E. Gaither Harris	Maryland
Festus Joseph Nee	Massachusetts
Edmund Waldo Pardee	New York
Nestor Rivera Porrata	Porto Rico
Frederick William Schaake	Massachusetts

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

August and September, 1906.

AUGUST.

American Dental Society of Europe. Berlin, Germany. Four days: August 1st to 4th.

Central-Verein Deutscher Zahnärzte. Dresden, Saxony. Three days: August 4th to 6th.

International Dental Federation. Geneva, Switzerland. Two days: August 8th and 9th.

SEPTEMBER.

Canadian Dental Association. Montreal. Four days: September 5th to 8th.

Interstate Dental Fraternity. Atlanta. September 17th.

National Association of Dental Examiners. Atlanta. Four days: September 14th to 17th.

National Association of Dental Faculties. Atlanta. September 14th.

National Dental Association. Atlanta. September 18th.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

General Meeting to be held in Geneva, August 8 and 9, 1906.

The next annual meeting of the Fédération Dentaire Internationale will be held in Geneva, Switzerland, August 8 and 9, 1906. By direction of Dr. W. D. Miller, its president, and upon the authority of the Executive Council, the meeting will be a general one, at which all members of the F. D. I. and those eligible for membership who may be interested in the work and purposes of the Federation are invited to be present.

Provisional Program.

OPENING SESSION.

(1) President's address.

(2) Report of the secretary-general.

(3) Report of the treasurer and appointment of auditors.

(4) Election of members of the *International Commission on Nomenclature.* (Chairman, Dr. John Grevers, Amsterdam.)

(5) Election of members of the *International Commission on Jurisprudence and Professional Ethics.*

(6) Motion by a member to hold biennial or triennial meetings only.

(7) Discussion as to what shall be the plan of work of the F. D. I. in the immediate future.

MEETINGS OF COMMISSIONS.

I. *Commission of Education.* (Chairman, Dr. Truman W. Brophy, Chicago.)

(1) Motion by the French National Committee: Adoption of a definite plan of work for the commission, and study of the best means to be employed in order to bring about the establishment of regular relations between reputable dental colleges of different countries.

(2) Motion by Dr. Arkövy: Dentistry (stomatology) is a branch of general medicine and belongs to the structure of medical science and medical education.

(3) Motion by Angelo Chiavaro, Rome: Physicians intending to pursue dental courses at dental schools must pledge themselves to continue such studies long enough to acquire a sufficient degree of skill and knowledge of the practical branches of dentistry to enable them to practice dentistry in a manner creditable to the profession.

II. *Commission of Hygiene and Public Dental Service.* (Chairman, Dr. L. C. Bryan, Basle, Switzerland.)

(1) Discussion on the advisability of publishing a booklet on dental hygiene.

(2) Motion by Dr. Bryan: (a) How are we to reach, interest, and educate the public in dental hygiene? (b) How shall the school children be treated to assure the development of a useful dentition through life? (c) How shall the needy public be treated?

III. *Commission on Military and Naval Dental Service.* (Chairman, Dr. Williams Donnally, Washington, D. C.)

IV. *International Commission on the Dental Press.* (Chairman, Dr. A. W. Harlan, New York.)

Study of the means to be employed to bring about the creation of an international dental organ, and to establish closer relations between the professional journals of different countries.

V. *Commission on Jurisprudence and Professional Ethics.* (Chairman, Dr. Wm. Carr, New York.)

VI. *Commission on History of Dentistry.* (Chairman, Dr. Charles McManus, Hartford, Conn.)

VII. *Commission on Dental Nomenclature.* (Chairman, Dr. John Grevers, Amsterdam.)

VIII. *Commission on the definition of What Shall Constitute a National Committee.* Drs. Harlan, Wm. Guye, and E. Sauvez.

IX. *Commission on the Means to be Employed to Furnish the Poorer Classes with a Cheap Tooth-brush.* (Chairman, Dr. Haderup, Copenhagen.)

CLOSING SESSION.

(1) Report of auditors and consideration of treasurer's report.

(2) Reports of the various commissions and vote of resolutions.

(3) Designation of date and place of next meeting.

(4) Individual motions.

Edward C. Kirk, *Secretary-general.*

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The twenty-fourth annual meeting of the National Association of Dental Examiners will be held at the New Kimball House, Atlanta, Ga., September 14th to 17th, commencing 10 A.M., Friday, September 14, 1906.

The rates per day will be, European plan, from $1.50 to $4.00; American plan, from $3.00 to $6.00, governed by choice of rooms.

The convention hall is in the hotel, and every effort will be made by the proprietors for the care and comfort of the members.

Arrangements are being perfected for those desiring a short ocean trip at reduced rates, via the Clyde and Old Dominion steamship lines, notice of which will be given by circular later.

Chas. A. Meeker, *Sec'y,*
29 Fulton st., Newark, N. J.

NATIONAL DENTAL ASSOCIATION.

Tenth Annual Session.

The tenth annual session of the National Dental Association will be held in Atlanta, Ga., commencing Tuesday, September 18, 1906.

The New Kimball House has been selected by the local committee of arrangements as headquarters, where all general sessions of the association and of the sections will be held. The rates per day at the New Kimball House will be—European plan, from $1.50 to $4.00; American plan, from $3.00 to $6.00, governed by choice of rooms.

The usual railroad rate of one and one-third fare for the round trip, certificate plan, will be arranged for, and definite dates and particulars given later by Dr. J. D. Patterson, chairman of the Executive Committee.

Governor James M. Terrell will welcome the association to Atlanta, and Dr. D. D. Atkinson of Brunswick, Ga., on the part of the dentists of Georgia, will also deliver an address of welcome. To these addresses a response will be made by Dr. B. Holly Smith for the association. An old-fashioned Georgia barbecue is offered to the association in the way of entertainment, to be held at the "Cue Club" on an afternoon.

The general officers and those of the sections, as well as the committee chairmen and their members, have been working hard to provide an interesting and instructive program, and a large attendance is expected.

In one of the general sessions, Chas. McManus, Hartford, Conn., chairman Committee on History, will present an illustrated paper on "The Remarkable History of the Profession and the Splendid Character of the Men of the Past Who Helped to Build It Up," and A. W.

Harlan, New York city, will present a paper on "The Blue Light and Heat as Therapeutic Agents."

Section I.

This section presents the following program of papers for consideration: "The Present Status of Porcelain Inlays," John Quincy Byram, Indianapolis, Ind.; "Orthodontia," Richard Summa, St. Louis, Mo.; "A Phase of Art in Prosthesis," George H. Wilson, Cleveland, Ohio; "Porcelain," C. N. Thompson, Chicago, Ill.; "Setting Crowns and Bridges with Gutta-Percha," L. G. Noel Nashville, Tenn.; "Orthodontia," Victor H Jackson, New York city; "Orthodontia," Calvin S. Case, Chicago, Ill.; "The Inevitable Outcome of Crown and Bridge Work," E. Parmly Brown, New York city; "General Practice," W. Leon Ellerbeck, Salt Lake City, Utah.

B. L. Thorpe, *Ch'm.*, St. Louis, Mo.
D. O. M. LeCron, *Sec'y*, St. Louis, Mo.

Section II.

This section presents the following program of papers for consideration: "Manual Training an Essential to Dental Education," Burton Lee Thorpe, St. Louis, Mo. Subject not given: Geo. S. Vann, Gadsden, Ala. "Prosthetic Nomenclature." Geo. H. Wilson, Cleveland, Ohio; "The Nomenclature of Materia Medica and Therapeutics," A. H. Peck, Chicago, Ill.; "Operative Dentistry," H. H. Johnson, Macon, Ga.

Howard E. Roberts, *Ch'm.*, Phila., Pa.
C. S. Butler, *Sec'y*, Buffalo, N. Y.

Section III.

This section presents the following program of papers for consideration: (Subject to be announced), W. J. Roe, Philadelphia, Pa.; 'Treatment of Pyorrhea Alveolaris with Stereopticon Illustrations of Cases Before and After Treatment," Gordon White, Nashville, Tenn.: Chairman's Address, "Review of Progress for the Year in Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects," by the chairman, the vice-chairman, and the secretary.

Geo. V. I. Brown, *Ch'm.*, Milwaukee, Wis.
W. E. Grant, *Vice-Ch'm.*, Louisville, Ky.
W. H. G. Logan, *Sec'y*, Chicago, Ill.

Oral Hygiene.

The Committee on Oral Hygiene promise an interesting summary of their work, illustrated methods of teaching the science to both dentists and laymen, essays, resolutions, and the report of the committee.

J. P. Corley, *Ch'm*, Greensboro, Ala.
F. W. Stiff, *Sec'y*, Richmond, Va.

Clinics.

CHAIR CLINICS.

Alabama.—Dr. J. H. Crossland, Montgomery: "Stomatic Prophylaxis." Dr. J. P. Corley, Greensboro: "Teaching the Technique of the Dental Toilet."

Connecticut.—Dr. L. C. Taylor, Hartford: "Method of Filling Small Cavities in Children's Front Teeth (ten to twelve years)."

Indiana.—Dr. J. C. Byram, Indianapolis: Subject not given.

Iowa.—Subjects not given: Dr. J. V. Conzett. Dr. W. R. Clack. Dr. F. T. Breene. Dr. C. M. Work.

Missouri.—Dr. Wm. Conrad, St. Louis: 'Some Uses of Nitrate of Silver." Dr. H. F. Cassel, St. Louis: "Difficult Partial Impression in Plaster."

New Hampshire.—Dr. A. W. Woodman, Plymouth: "Cavity Preparation and the Insertion of Cohesive Gold," or, "Extraction, Using Somnoform."

New York.—Dr. N. S. Shields, New York: "The Use of Keeton-Williams Gold in Combination with Cement."

North Carolina.—Dr. F. L. Hunt, Asheville: "Porcelain Inlays: Cervical Cavity Restoring Recession of Gum with Pink Enamel." Dr. I. N. Carr, Durham: "The Real Cohesive Property of Ambler's Cohesive Tin Foil." Dr. C. W. Regan, Laurinburg: "Cast Fillings, Alexander Method."

South Carolina.—Dr. A. P. Fleming, Spartanburg: "Hollow Retention for Gold Inlays."

Virginia.—Dr. F. W. Stiff, Richmond: "Ivory's Crystal Alloy with Watt's Gold."

Wisconsin.—Dr. W. H. Cudworth, Milwaukee: "Porcelain Inlay Restoration, Central Incisor." Dr. F. G. Van Stratum, Hurley: "Restoration of Central Incisor, Using Platinum and Gold."

Kansas.—Dr. F. O. Hetrick, Ottawa: "Gold Filling, Using Combination of Mat and Foil in Mesio-occlusal Cavity in First or Second Molar."

TABLE CLINICS.

Alabama.—Dr. L. G. Pierson, Selma: "An Original Method of Bridge Work without Showing any Gold." Dr. J. C. Chisholm, Selma: "Esthetic Bridge Work." Dr. J. A. Hall, Collinsville: "A Temporary Inferior Denture, or an Emergency Set of Under Teeth."

Connecticut.—Dr. F. T. Murlless, Jr., Windsor Locks: "The Use and Manipulation of Gutta-Percha."

District of Columbia.—Dr. L. T. Davis, Washington: "Use of Vulcanite Pinless Teeth in Crown and Bridge Work." Dr. H. P. Dawson, Washington: "Method of Lateral Bicuspid Attachment in Bridge Work, Preserving the Buccal Wall." Dr. S. Jaffe, Washington: "A Method of Utilizing a Live Bicuspid in Bridge Work without Showing Gold." Dr. H. Porter Davis, Washington: "Refining Gold Scraps in the Dental Office."

Georgia.—Dr. J. H. Lorenz, Atlanta: "Inlays and Hoods for Bridge Abutments."

Kansas.—Dr. W. A. Coston, Topeka: "Porcelain." Dr. A. Lehrman, Kansas City: "A Method of Knowing If the Bite is Correct—Absolute."

Louisiana.—Dr. S. H. McAfee, New Orleans: "Removable Facing for Crown and Bridge Work."

Missouri.—Dr. D. O. M. LeCron, St. Louis: "Cavity Preparation for Gold and Porcelain Inlays, Showing Plaster Models." Dr. F. Webster, Carthage: "Crown and Bridge Work." Dr. D. J. McMillen, Kansas City: "Bandless Metal Crown." Dr. D. D. Campbell, Ozark: "Contour Gold Inlay; 'Two Hours Saved.' " Dr. E. P. Dameron, St. Louis: "Use of Interchangeable Facings."

Massachusetts.—Dr. Chas. E. Parkhurst. Somerville: "Gold Inlays and Splints for Loose Teeth." Dr. A. W. Doubleday, Boston: Subject not given.

New York.—Dr. R. Ottolengui, New York: "Artificial Velum." Dr. V. H. Jackson, New York: "Orthodontia: Jackson System." Dr. M. C. Tracy, New York: "New Ideas in Porcelain Crowns."

North Carolina.—Dr. J. A. Gorman, Asheville: "Orthodontia."

Pennsylvania.—Dr. J. A. Libbey, Pittsburg: "Removable Saddle Bridge with Gold Inlay Abutment and Rubber Attachment."

Texas.—Dr. R. W. Carroll, Beaumont: "An Original Method of Making a Porcelain-Face Crown."

SURGICAL CLINIC.

Wisconsin.—Dr. B. G. Maercklein. Milwaukee: "Cleft Palate, Hare-lip, or Operation on Antrum."

A number of sources have not been heard from up to the present date, but it is confidently expected that by the time of the meeting the number of clinicians will be more than doubled.

Thos. P. Hinman, *Ch'm.*, Atlanta, Ga.
C. L. Alexander, *Sec'y*, Charlotte, N. C.

It is earnestly desired that there shall be a large attendance of members and delegates, so that the committee appointed to devise ways and means to own and control a dental journal may feel encouraged to launch such a scheme as will at once meet approval and hearty support, and the association have members enough to guarantee the project.

Many other features for a new era of success in the National Dental Association can be mapped out at the Atlanta meeting, if only we have a sufficiently large and enthusiastic gathering of the members of the profession to make it appear worth while.

Dr. S. W. Foster, Atlanta, Ga., has accepted the chairmanship of the Local Committee of Arrangements, in succession to the late Dr. J. A. Chapple.

M. F. Finley, *President*, Washington, D. C.

NATIONAL ASSOCIATION OF DENTAL FACULTIES

The annual meeting of the National Association of Dental Faculties will be held in Atlanta, Ga., commencing at 2 P.M., Friday, September 14, 1906. The executive committee will meet at 10 A.M. on the same day.

H. B. Tileston, *Ch'man Ex. Committee,*
R. M. Sanger, *Sec'y Ex. Committee,*
East Orange, N. J.

AMERICAN SOCIETY OF ORTHODONTISTS.

The next meeting of the American Society of Orthodontists will be held in New York city during Christmas week, 1906.

Frederick S. McKay, *Sec'y*, St. Louis, Mo.

CANADIAN DENTAL ASSOCIATION.

The Canadian Dental Association will hold its third bi-annual meeting in Montreal, Quebec, September 5 to 8, 1906.

Drs. S. H. Guilford and W. A. Capon, Philadelphia, and G. Lenox Curtis and F. L. Fossume, New York city, are among the outsiders contributing papers and clinics. A successful meeting is anticipated.

C. F. Morrison, *Sec'y*,
Montreal, Can.

INTERSTATE DENTAL FRATERNITY.

The annual meeting of the Interstate Dental Fraternity will be held at the New Kimball House, Atlanta, Ga., on Monday, September 17, 1906.

The meeting and banquet will be in charge of Dr. Thos. P. Hinman, the vice-president for Georgia. Dr. Hinman's well-established reputation as a host is a sufficient guarantee for a royal good time for all the fraternity who can arrange to be there. Do not miss it.

R. M. Sanger, *Nat'l Sec'y.*

ST. LOUIS DENTAL SOCIETY.

Fiftieth Anniversary.

The St. Louis Dental Society—the oldest dental society in continuous existence—is contemplating the celebration of its fiftieth anniversary during the month of November. A special committee is at work on the program and hope to have it ready for the September journals.

J. H. Kennerly, St. Louis, Mo.

TEXAS STATE DENTAL ASSOCIATION.

The Texas State Dental Association held its annual meeting at Galveston, June 14, 15, and 16, 1906, with one hundred and fifty in attendance.

The following officers were elected: R. D. Griffis, president; A. A. Dyer, first vice-president; Chas. H. Edge, second vice-president; G. W. Staples, secretary and treasurer; A. F. Sonntag, curator. Executive Committee, C. J. Smith, C. L. Watson, and J. W. Combs.

G. W. Staples, *Sec'y*, Dallas, Texas.

COLORADO STATE DENTAL ASSOCIATION.

The twentieth anniversary meeting of the Colorado State Dental Association was held in Denver, at the Brown Palace Hotel, on June 19, 20, and 21, 1906. The meeting was a notable one, the essays and clinics being of unusual interest. A large attendance and keen interest was had throughout the sessions. Colorado Springs was chosen as the next meeting place.

The newly elected officers are as follows: Dr. J. Allen Smith, Colorado Springs, president; Dr. G. A. Dille, Denver, vice-president; Dr. H. Frank Gray, Colorado Springs, secretary; Dr. Wm. Smedley, Denver, treasurer.

COMMITTEE ON DENTAL HISTORY, N. D. A.

At the Buffalo meeting of the National Dental Association, the Committee on History of Dentistry reported to the association that Dr. Vincenzo Guerini of Naples, Italy, had written a History of Dentistry from the earliest times down to the beginning of the nineteenth century, which work is in the hands of the committee, having been translated into English and fully revised and edited. Dr. Guerini has generously placed the publication of this great work under the patronage of the National Dental Association in token of his appreciation of American dental development. In order that the work may be published without financial loss it is necessary that about 700 subscriptions for copies at $5.00 each be obtained before contracts for printing, binding, and publishing the work can be entered into, and the duty of securing these advance subscriptions has been assigned to the Committee on History of Dentistry of the National Dental Association.

The committee believes that the general and growing interest in the history of our profession is a sufficient warrant for this undertaking. Our historical records are scattered through a vast literature and much of it is of great antiquity. These data have never before been gathered together and arranged in a consequential logical order. Dr. Guerini has spent many years of his professional life and large amounts of money in collecting the material for this work. It has involved the searching of libraries and museums, the translation of many old documents and publications, and the digesting and arranging of this matter into proper form. As an historical writer the distinguished author needs no introduction, as his contributions on dental history in our magazines are well known, and their excellence is an earnest of the excellent and exhaustive character of his larger work now in the hands of the Committee on History of Dentistry for publication.

The importance and value of dental art and science as a humane service is well recognized, but we are so accustomed to view this question from the modern standpoint that we, generally speaking, overlook the immense work done by our predecessors, reaching far back in unbroken line to the mists of antiquity. It was they who laid the foundations upon which modern dentistry has been built, and no man can peruse the record of their efforts as set forth in Dr. Guerini's book without developing a higher appreciation of their work and a keener realization of the worth and dignity of the calling which they in common with ourselves followed.

It is the desire of the committee having this matter in charge to secure as promptly as possible the subscriptions necessary before the work can be published. We ask you to consider this as a personal appeal to forward your subscription for the work to Dr. Charles S. Butler, The Frontenac, Buffalo, N. Y., who, with the treasurer of the National Dental Association, Dr. V. E. Turner, Raleigh, N. C., will act as custodian of the publication fund.

Announcement will be from time to time made in the dental journals of the growth of the subscription list and the progress of the work of publication. The sooner the required 700 names are obtained, the sooner the work can be issued. The volume, it is estimated, will comprise about 500 pages. It will be profusely illustrated, and bound in cloth.

In case this proposed publication meets with the success which it merits, a second and companion volume, treating of the more modern aspect of dentistry, will probably be issued under the same auspices and conditions.

Edward C. Kirk, Philadelphia.
Wm. H. Trueman, Philadelphia.
Gordon White, Nashville, Tenn.
H. L. Ambler, Cleveland, Ohio.
Jas. McManus, Hartford, Conn.
J. Y. Crawford, Nashville, Tenn.
A. H. Fuller, St. Louis, Mo.
S. A. Freeman, Buffalo, N. Y.
W. E. Boardman, Boston, Mass.
Charles S. Butler, Buffalo, N. Y.

Burton Lee Thorpe, *Sec'y*, St. Louis, Mo.
Chas. McManus, *Ch'man*, Hartford, Conn.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JUNE 1906.

June 5.

No. 822,582, to **John P. Carmichael**. Attachment for natural teeth and method of forming same.

June 12.

No. 823,150, to **Charles L. Alexander**. Dental handpiece.

No. 823,167, to **William F. Green**. Dental-disk shield.

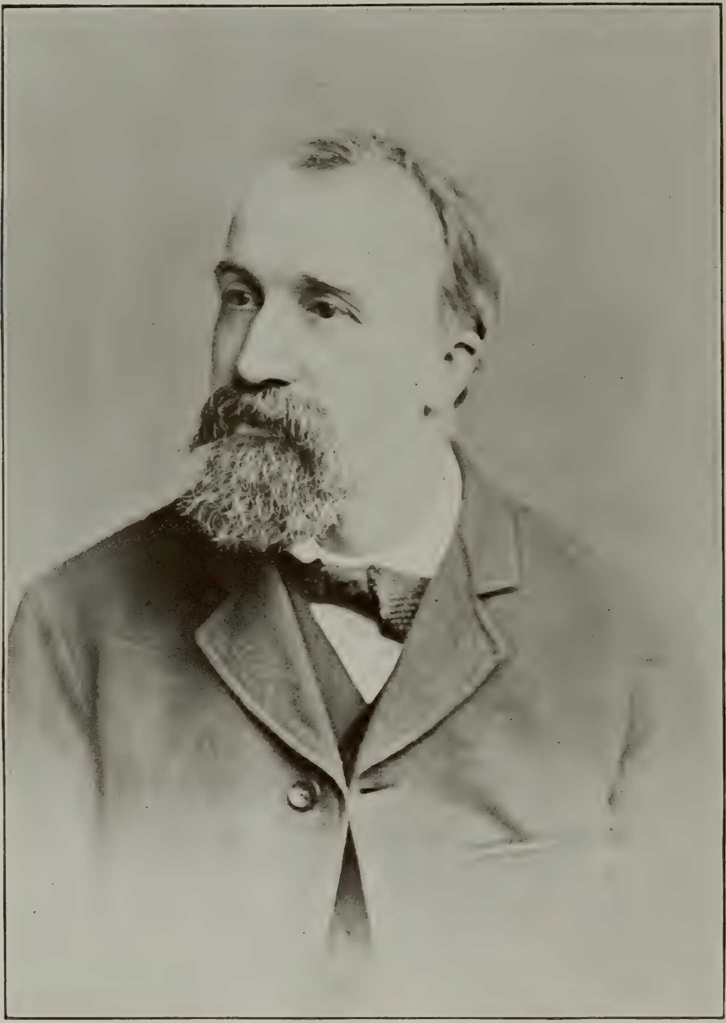
June 26.

No. 824,096, to **Walter W. Crate**. Dental articulator.

No. 824,111, to **Harry A. Gollobin**. Process for making teeth.

No. 824,218, to **Stanley Towle**. Process for making dental devices.

No. 824,465, to **David N. Booth**. Metallic support for artificial teeth.



DR. HENRY WESTON.

THE

DENTAL COSMOS.

VOL. XLVIII. SEPTEMBER 1906. No. 9.

ORIGINAL COMMUNICATIONS.

CYSTS OF THE ORAL CAVITY: RANULA.

By VIDA A. LATHAM, M.D., D.D.S., F.L.S., F.R.M.S., Chicago, Ill.

(Read before the Massachusetts State Dental Association, at its annual meeting, Boston, June 5, 1906.)

IN considering the various pathological changes that may occur in connection with the teeth, there is one which, although it may not be purely dental, is nevertheless full of interest, not only to the stomatologist, but also to all scientific workers and to the general public. The above title indicates a big field for work, but I do not intend to take up more than one division of this subject, namely, a class of cysts of which I have had a few cases in practice. We must not think that the subject of cysts, especially those pertaining to the head and neck, is well understood, particularly the class of cyst known as ranula. This term, ranula, is probably one of the oldest in surgery and its etymology is not very obvious. It seems to be synonymous with batrachus, or frog-tongue (Gr. *batrachos,* frog), coming from Lat. *rana*, frog. It has been restricted by some to obstructions of Wharton's duct, and by others to obstructions of the sublingual ducts.

As there are a number of cysts, it may not be out of place to briefly recall the main classification:

(1) Sebaceous Cysts or Wens. *Skin.*
(2) Sudoriparous Cysts. *Skin.*
(3) Muciparous Cysts. *Mucous membrane.*
(4) Ranula. *Salivary glands.*

Until recently the term "ranula" was applied to all cysts in the floor of the mouth, and as cysts in this situation are of various kinds and arise from different structures, it naturally followed that the term gradually came to possess a topographical significance. At the present time the term should be restricted to those cysts arising in connection with the ducts of the three sets of salivary glands opening into the mouth, and should be designated as "submaxillary," "sublingual," or "parotid" ranula, according to the gland affected. If stomatologists and surgeons would adopt a uniform meaning for this term, much confusion and misunderstanding would be avoided.

In the majority of cases ranulæ are probably simply retention cysts due to obstruction of a duct, and their most common occurrence in the order of frequency is as follows: (1) In the submaxillary or Wharton's duct, (2) in the sublingual or Rivini's duct, (3) in the parotid or Steno's duct; in the last-named situation, although very rare in man, they have been observed in calves, oxen, and horses. It must be remembered that all tumors situated beneath the tongue are not necessarily ranulæ, for we find in that location cystic tumors of other varieties, such as muciparous cysts of the Blandin-Nuck glands, dermoid cysts, and cystic hygroma. Lannelongue* mentions congenital ranula, but Butlin† thinks that they are probably "congenital cystic hygroma, or one of the cysts belonging to such a class of tumors."

In regard to the investigations on the character of the encysted fluid of ranulæ, which is neither saliva nor any fluid that could be formed from saliva, we must remember that many cysts contain fluid decidedly altered in character. For example, an obstructed gall-bladder is sometimes filled with fluid that does not possess the smallest resemblance to bile. So a cyst arising in connection with a salivary gland may contain fluid that scarcely furnishes the characteristic reactions of saliva.

The common origin of ranulæ is the obstruction of a duct, this being the case especially with those in the floor of the mouth. They may follow operations such as amputation of the tongue, through injury to the duct or by its being bound up in cicatricial tissue. The stomatologist will often detect them through the discomfort they cause when pressed upon by a lower denture. Ranulæ may become infected and ulcerated through abrasions of the mucous membrane during the first few days after the insertion of a plate. The deposition of calculi is also a frequent cause of ranula.

The cysts may be thin or thick walled, the latter most often in cases of long standing complicated with severe inflammatory phenomena. They lie in the furrow between the gum and the tongue, and bulge upward into the floor of the mouth. When large they cause a prominence in the submaxillary triangle. The duct is not always completely blocked, yet the fluid is retained, this being especially the case where it is made up of mucus and a glairy fluid like the yoke of an egg. It is reasonable to believe that ranulæ sometimes arise independently of obstruction of the main duct, as in the case of the so-called pancreatic ranulæ, where observation supports the view of the existence of a pathological cause apart from the mere obstruction concerned in their production. Cysts may spontaneously rupture and recur several times during intervals of rest. All tumors of the floor of the mouth should not be regarded as ranulæ, and we must especially be on the lookout for foreign substances in the ducts, as bristles from the tooth-brush, salivary calculus, straws, toothpicks, and for inflammation and sepsis of traumatic origin.

Morrant Baker has conclusively shown that ranula is not usually a dilatation of Wharton's duct, as was formerly taught, and consequently care must be exercised in examining the tumor to ascertain by pressure whether the duct is obliterated or not. In many cases the duct is not occluded and a probe can be easily passed, as noted by Bernard, Weber, Baker, Sutton, Senn, and others.

To further differentiate ranulæ, we have to consider the dermoid cysts which arise near the frenum of the tongue or deep in its substance. The racemose mucous glands known as Blandin-Nuck also found in the floor of the mouth beneath the frenum linguæ are prone to become cystic, as noted by Sonnenberg and Von Recklinghausen.*

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*Lannelongue. "Affections Congénitales," 1891.

† Butlin. "Kystes Congénitaux." 1886.

Before the occurrence of the cyst there is usually some inflammation of the mucous membrane, very often associated with affections of the teeth or neighboring structures.†

MM. Tillaux and Guyon have investigated the origin of sublingual cysts. In this form of ranula the tumor always develops on the side of the buccal cavity, thrusting the tongue upward and backward, and very rarely depressing the floor of the mouth. In submaxillary ranula the growth spreads downward toward the neck. Giraldès makes a distinction between ranula properly so called and cysts of the submaxillary gland which is of some importance as bearing upon the question of operative intervention. There are cases, however, where the dilatation of Wharton's duct may take place both in an upward direction toward the mouth, and in a downward direction toward the neck, and in these cases the line of distinction between the sublingual and the submaxillary ranula is not so well marked. Probably ranula rarely occurs as a dilatation of Wharton's duct, its origin in the author's opinion usually being due to an obliteration and consecutive ectasis of one of the numerous conduits of the sublingual gland. Cases have been known where the production of the ranula was very acute and sudden, and even threatened asphyxiation.

Calculi occur more often in the sublingual ducts than in the submaxillary (Rokitansky). Retention cysts of Steno's duct have been seen and described by Bruns, but are exceedingly rare.‡ So many interpretations have been given as to the origin and nature of the sublingual cysts that were formerly classified under the head of "ranula," that every case that can be carefully studied both anatomically and histologically will, if carefully described, help very much in clearing up a not very well described pathological subject. These cysts are not so commonly met with that they should be dismissed as though of no importance, for, unfortunately, if the stomatologist or surgeon feels so, the patient does not.

Pauli believed that they were formed by a dilatation of Wharton's duct and called the swelling "ptyalectasis"—or "ptyalocele" after rupture of the duct with accumulation of saliva in the connective tissue. Virchow, with good reason, objected to the latter view of their mode of origin; he asserted that the saliva extravasated into the connective tissue would become absorbed.

Fleischman claimed that the salivary ducts could not dilate to the extent seen in cystic swellings under the tongue. He believed that these cysts are hygromata of the base of the genio-glossus muscle. Gurlt and Bernard asserted that the submaxillary gland secreted a mucoid substance analogous to the contents of the cysts so frequently found on the side of the tongue. Ptyalin and rhodankalium, however, have never been discovered in the contents of a ranula. The absence of these two substances in the contents of a ranula is, however, no proof that the cyst is not a dilated duct of the salivary gland, as the cyst contents undergo chemical changes which make the secretions pathological when examined microscopically and chemically.

Bernard and Weber not only detected the orifice of the duct upon the wall of a retention cyst of Wharton's duct, but they passed a fine probe through the orifice into the cyst, and so proved the connection of the cyst with the duct. When Neumann made histological examination of part of a cyst wall and saw the ciliated epithelium he was inclined to regard the foramen cecum as the starting-point of the cyst. In some cases the foramen cecum does not terminate in a cystic sac, but follows in the direction of the median glosso-epiglottic ligament. The posterior end of this prolongation contains many

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*Recklinghausen, *Virch. Archiv*, lxxxxiv, v, 1881; J. Coat's "Manual of Pathology," p. 249 (illustrated).

† Tillaux, Guyon, and Giraldès, *Med. Times and Gazette*, London, 1870.

‡ A case of this variety, of the right duct, is now under my care.

mucous glands on the side of the tongue, hidden by the genio-glossus muscle. We must not forget that there are growths bearing some points of resemblance to a ranula originating in obstructed muciparous glands, and also that an enlarged submaxillary bursa bears some likeness to ranulæ in external appearance.

The anatomy must be borne in mind. The submaxillary gland is situated below the mandible in the anterior part of the submaxillary triangle, and is covered by integument, the platysma myoides, and the deep cervical fascia. The peculiarity of Wharton's duct of the submaxillary gland is that it commences by numerous radicles within the substance of the gland, which form a single tube of about two inches in length having walls much thinner than those of the parotid duct, and ending in a narrow orifice on the summit of a small papilla at the side of the frenum linguæ. The sublingual glands, the smallest of the true salivary glands, are of about one dram in weight, and are lodged beneath the mucous membrane of the floor of the mouth on each side of the frenum linguæ, and reach from the anterior margin of the submaxillary gland to the symphysis mentis. Their ducts, of which there are from eighteen to twenty for each gland, open into the mouth on the elevated crests of the mucous membrane caused by the projection of the glands on each side of the frenum. While in some cases an exact differential diagnosis may be impossible, it is not difficult in many cases of growths presenting the general appearance of ranula to determine the organ or structure to which they belong.

An obstructed submaxillary duct, when the obstruction is at or near its margin, forms an ovoid, elastic, translucent swelling which is first noted beneath the tongue to one side of the frenum, and which does not press down upon the tissues, causing the peculiar fulness to the throat below the chin from which its name ranula is derived, until it has attained considerable size. More commonly it is about the size of an almond, though it may and does in some cases increase in volume to such an extent as to constitute a danger of suffocation. When opened the fluid is clear, albuminous, and of about the consistence of an egg, alkaline in reaction, and may contain phosphatic concretions, which can usually be felt before the sac is opened. One peculiarity to be noted is that when the gland increases considerably in size so as to involve the whole of Wharton's duct, including the canals within the gland, the latter is absorbed in consequence of the pressure, and the tumor ceases to grow through atrophy. Obstructions of the sublingual duct form similar growths, which beginning first within the mouth, in some cases press down upon the gland and then undergo atrophy. The sublingual cysts contain a fluid different from that of the submaxillary, viz, it is more viscid. Both forms of growth are rare, and exceptional examples are seen in which the obstruction takes place at a point remote from the orifice and perhaps near the glands. In such cases the oval projection does not occur beneath the tongue, but early in the case is much more prominent below the chin than in the floor of the mouth, and consequently presses on the ducts.

Those tumors resulting from the obstruction of the muciparous glands are more circular, and probably never become larger or press down into the structures of the neck. They are *opaque,* because of the epithelium of which they are composed and of the production of oil, and because of granulation within the cells consequent upon degenerative changes, making the contents as thick almost as putty—thus affording a means of differentiation from the other forms. Connective tissue growths in this region are *not translucent,* lie deeper, and contain only serum with probably a few phosphatic or calcic concretions.

Tumors caused by enlarged bursæ, which may be congenital, contain clearer serum, lie deeper than the floor of the mouth, and project less into the oral cavity and much more below the chin.

In investigating nine salivary gland cysts, all but one contained calcic formations in Wharton's duct, and only one in Steno's duct. Menocal de Cardenas has reported a congenital ranula in the newborn.*

There are two forms of true ranulæ:

(1) Those in which the obstruction of the duct takes place at or near the orifice, as seen in the transparent sublingual growth with more or less projection below the chin.

(2) Those in which the obstruction is at or near the gland with no sublingual growth, there being merely a general uplifting of the floor and a much greater prominence of the lining below the chin.

TREATMENT.

When the obstruction is at or near the gland and the substance of the gland itself is involved in the tumor, as indicated by the tumor not having its usual translucent appearance under the tongue, but lying deep under the floor of the mouth, projecting chiefly beneath the chin, between it and the hyoid bone, it is best to open the sac at a point below the chin, and after a few days, when the sac has been thoroughly drained, destroy the secreting membrane by means of tincture of iodin, tents, etc. To open the sac from the mouth in such cases is an inadvisable procedure, inasmuch as we incur the danger of hemorrhage, and also because the long open wound is annoying to both the surgeon and the patient, and the fistulous opening is difficult to keep from becoming partially closed, the operation thus failing in obliterating both the duct and the gland.

Again, this form of ranula is commonly confused with simple serous cysts which develop in the gland substance, or with other simple growths, in either of which instances we must completely destroy the secreting wall and not attempt to re-establish the canal. True excision by dissection of simple cysts is best, but because of the difficulty of establishing an accurate diagnosis we should resort to incision rather than excision.

RULES FOR THE TREATMENT OF RANULÆ AND BURSÆ.

(1) When well marked, translucent, and situated well within the mouth, re-establish the duct opening by a free excision of the projecting mass.

(2) When deep-seated, involving the gland substance, open the integument, and insert a drainage.

(3) Simple serous cysts (if diagnosis be not doubtful) should be extirpated, though it is safer to resort to incision and injections.

Obstruction of Steno's duct at its orifice results from abrasion or adhesions of mucous membrane at its orifice, and may open spontaneously.

Encysted tumors from calculi in Steno's duct. The hard nodules which can be easily detected on the inside of the mouth may cause inflammation, adhesion, and infection of the duct walls. It is best to lay the duct open and extract the calculus from the inside of the mouth, thus preventing the formation of a salivary fistula.

Obstruction of Steno's duct from adhesions by wounds, by ulcerations, etc. Salivary fistula of the face is the usual complication of this kind of obstruction. Although difficult to obliterate, this can usually be done by passing a large seton, freshening the edges of the wound, and uniting them with silver sutures.

Encysted new-growths are common from obstruction of the duct of the labial, buccal, lingual, and pharyngeal glands, and the follicles of the lips and the buccal and oral membranes.

The treatment is usually accomplished by simple evacuation through puncture, but in some cases probably the best treatment is by excision, curetting, and swabbing of the cyst walls.

Cysts of the tongue usually occur near the dorsum, and they require care in operating, for fatal results have followed their extirpation. Incision and injections is the best and the usual method. In treating a ranula after excising part of the cyst wall and cleaning the sac thoroughly, fill the latter with iodin, being careful not to injure the adjacent parts. Allow it to escape into the mouth, and pack the sac with lint wet with sterilized oil or unguentine, and renew the dressing daily. The use of injections of hot water is a very satisfactory adjunct to the foregoing treatment.

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* *Sajous' Year-book*, 1890.

Recently a series of cysts came under my notice in private practice. One of them, in a lady twenty-six years of age, was a cyst of the sublingual gland which had been diagnosed as an abscess by a local physician. As the lady declined to have it operated upon, he painted the chin and mouth with iodin and advised hot applications, and proposed an incision at a future time. I was called to attend the patient at an early hour of the morning, as she was threatened with asphyxiation; the iodin, I suppose, having stimulated the circulatory activity of the affected area, causing a swelling of the floor of the mouth and tongue which extended into the throat and almost occluded the fauces. The sudden increase of the swelling is the special point of interest in this case,

Fig. 1.

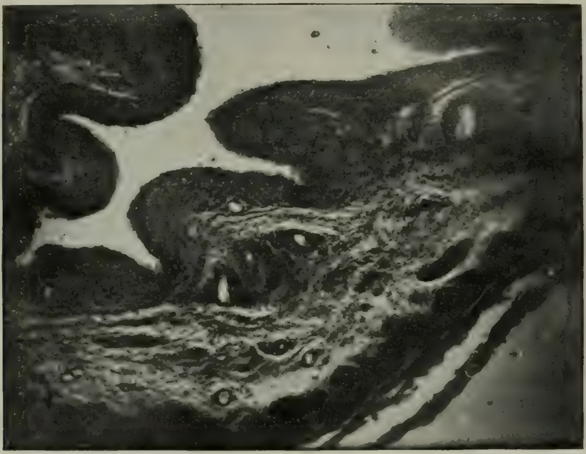
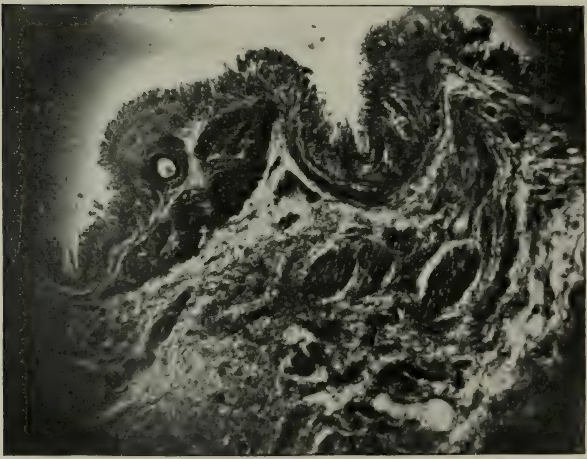


Fig. 2.



because of its comparative rarity. A trocar was passed through the floor of the mouth from below the chin, and the contents were drawn out with great difficulty. A drainage was left in for two days and was then opened up from the inside, and the wound healed very nicely. A sister of the same patient had at one time suffered from a submaxillary ranula.

Another case was that of a man in whom a submaxillary cyst developed on the left side following an attack of influenza, and resulted in severe tonsillitis and stomatitis, with infection of the anterior and posterior cervical glands. His wife applied poultices and then kerosene, and after causing much blistering of the neck, and severe pain, the patient sent for me. Neuralgia and deafness as well as painful deglutition and dysphagia were the principal complications. The swelling was well marked, prominent in the neck and extremely tender to the touch. The breath was foul and the temperature was 103°. After considerable cleansing with hot antiseptics and scaling of tartar I succeeded in placing the mouth in a fairly hygienic condition. I advised the patient against smoking and the use of all irritants, and tried to differentiate the swelling, which was globular and exceedingly hard. Salivary calculus seemed the most plausible cause of the disturbance, but the rapidity of appearance of the growth led me to rely on a diagnosis of abscess or ranula. After the swelling partly abated under catharsis, antisepsis, and depletion, I probed the duct, and after using gentle pressure for some time obtained a drop of greenish pus-looking material from under the tongue near the frenum. I then used a dilute solution of hydrogen dioxid, and passed the probe in a little farther, when more of the thick creamy material with blood exuded. After working as long as the patient would allow me, as the swelling was very painful and he refused anesthesia in any form, I passed in a little unguentine, as well as keeping the neck dressed with it, and postponed all further treatment until the next day, when he seemed better and relieved from pain. Further gradual probing caused the instrument to pass through the duct, and when the sac was reached, by using pressure from above and below I obtained about two drams of a copious ropy mass, and then some salivary fluid. After several days' washing out with an alkaline and saline antiseptic the growth disappeared.

I have had several cases of ladies who wore plates for the first time, where the pressure obstructed both the sublingual and submaxillary glands and was a cause of grave anxiety both to their families and to myself.

The photo-micrograph (see Fig. 1) shows very well the wall of the elongated cystic duct of a submaxillary ranula—the thickened inner wall and its lost pavement-epithelial layer. Fig. 2 is taken from the main cavity, and shows a well-marked columnar-epithelial lining, mucous glands, and a thickened fibro-muscular coat, in appearance very much like a section of the alimentary canal.

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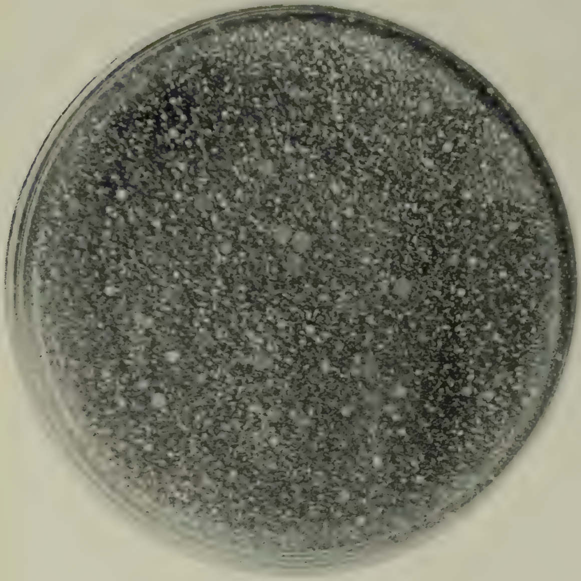
TOOTH-BRUSH STERILIZATION.

By DAVID MARSHALL HITCH, D.D.S., Philadelphia, Pa.

THE subject of the sterilization of dental instruments is of such importance that investigators—with the view of reaching a satisfactory solution of the question—have been at work upon it uninterruptedly and with unfaltering zeal almost since the promulgation of the axiom that infection is the immediate consequence of microbic invasion. Although the problem cannot as yet be considered in the light of a settled question, sufficient has already been accomplished to show, first, that bacteria which have found lodgment upon instruments can be destroyed effectively by means that will not lessen their surgical usefulness; and second, that unclean and infected instruments may become the source of disturbances, localized or general in character, of varied degrees of intensity.

FIG. 1.



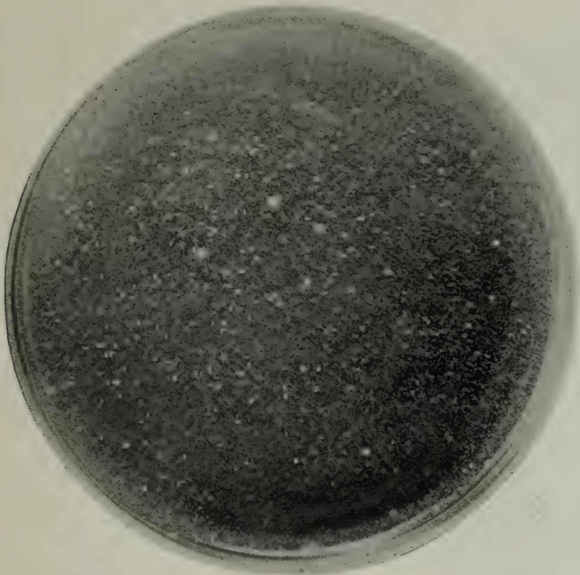
Brush No. 1 (Fig. 1).

Bacterium fulvum.
“ pseudo-diphtheriticum.
“ amabilis.
“ buccalis.
“ rodonatum.
Bacillus geminus.
“ subtilis.
“ coli.
“ solitarius.
“ alcaligenes.
Sarcina subflava.
“ flava.

In view of the aforesaid data, it is reasonable to assume that every practitioner who has the welfare of his patients at heart will not knowingly neglect to carry out such antiseptic precautions as are known to preclude the onset of inflammatory changes traceable to the use of infected instruments.

On the other hand, any practitioner neglecting to perform this imperative duty would be liable to criminal prosecution should any infection occur as the result of an injury to the soft tissues through the use of instruments known to have been insufficiently clean from a surgical standpoint. Instrument sterilization is, in the face of our present knowledge of bacteriology and pathology, a matter of necessity and not of choice; and while particular attention should be devoted to instruments which are used in the immediate vicinity of the gums and other soft tissues, those which are used upon the hard tissues of the tooth—mainly pluggers, chisels, excavators, explorers, etc.—should likewise be subjected to a process of thorough sterilization; for, should any of those instru-

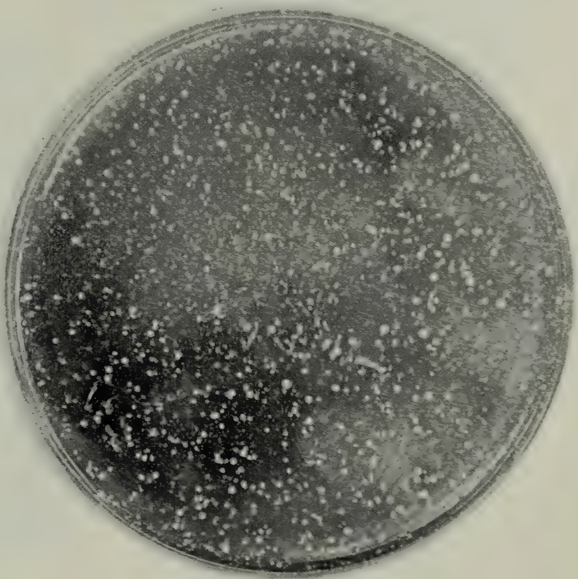
Fig. 2.



Brush No. 2 (Fig. 2).

Bacterium pseudo-diphtheriticum.
Bacillus cereus.
" ginglymus.
Sarcina flava.
Micrococcus aureus.
" salivarius.
Saccharomyces albus.

Fig. 3.

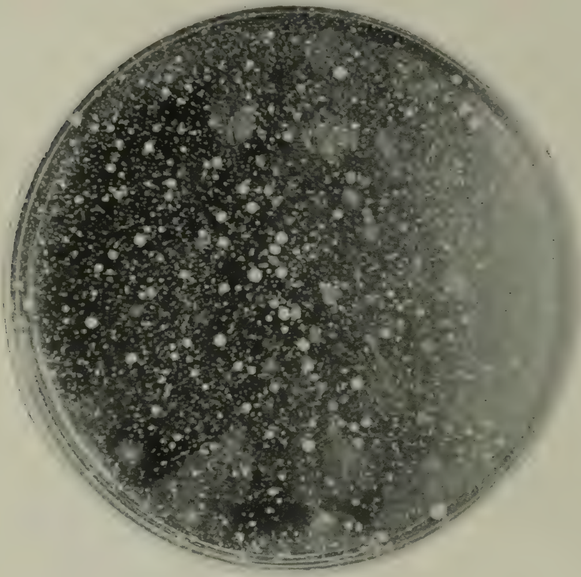


Brush No. 3 (Fig. 3).

Bacillus rudis.
" ginglymus.
Sarcina flava.
Micrococcus fervidosus.
" salivarius.
Saccharomyces roseus.

ments through an unavoidable accident injure the mucous membrane, the result would probably be just as disastrous as that which may follow an injury with infected scalers, lancets, etc. Consequently, if it be a universally recognized necessity that instruments coming in contact with the gums and soft tissues should be sterilized, why is it not just as much if not more of a necessity to sterilize the tooth-brush, the bristles of which not only come in contact

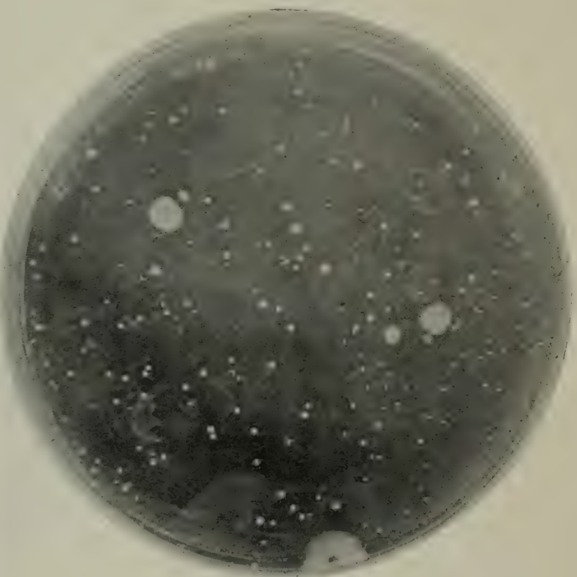
Fig. 4.



Brush No. 4 (Fig. 4).

Bacterium pseudo-conjunctivitidis.
" citreum.
‘ caudatum.
" fuscum.
" Czaplewskii.
Bacillus aurescens.
" Rheni.
" subflavus.
" geminus.
" formosus.
" levans.
" nitrificans.
Sarcina flava.
Saccharomyces roseus.

Fig. 5.



Brush No. 5 (Fig. 5).

Bacterium pseudo-diphtheriticum.
“ aerogenes.
Bacillus Rheni.
“ Hudsonii.
“ subflavus.
“ formosus.
“ Schaefferi.
Micrococcus salivarius.
“ ovalis.

with the gums but very frequently lacerate them, in some cases to the extent of causing a well-defined traumatic gingivitis.

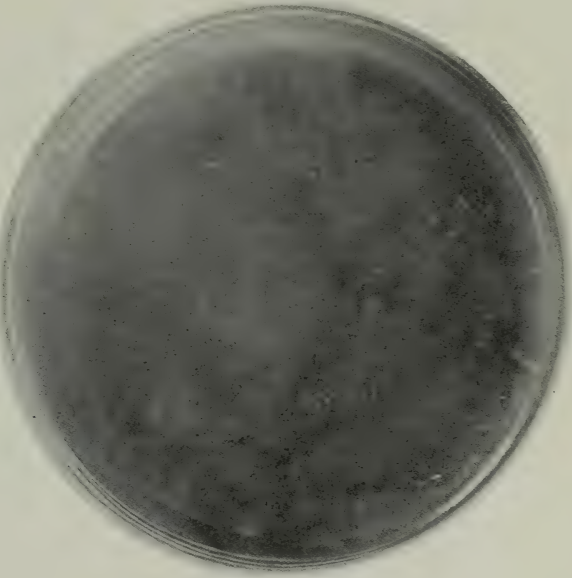
It might be added that the reasons for sterilizing the tooth-brush by chemical means are even more potent than those applying to the sterilization of steel instruments, for while the latter can at least be thoroughly cleansed by ordinary means, the tooth-brush, because of its peculiar construction and the arrangement of the bristles, cannot be kept clean even in the ordinary acceptation of the word.

In order to ascertain the nature of the infection of tooth-brushes, and furthermore, in order to show that even those in use by most careful persons are unsanitary, five different individuals known to be scrupulously clean in their habits were asked to send their brushes in the condition in which they were ordinarily put away after use. All these brushes were collected at the same time, and were sawed in half longitudinally; one-half of each brush was immediately placed in a specially constructed sterilizer, and the remainder of each brush was exposed to the air as it had been customary to do with them while in service. The unsterilized halves were then submitted to Dr. D. H. Bergey, first assistant in the Laboratory of Hygiene and Bacteriology of the University of Pennsylvania, who reports upon the identification of the bacteria found on the unsterilized portions of the six tooth-brushes. (See illustrations and descriptions.)

The numerous mouth-washes obtainable in the open market, while possessing certain advantageous features in connection with the use for which they are specifically intended, are, however, not sufficiently germicidal to satisfactorily sterilize the tooth-brush, and, as an evidence of this, brush No. 6, which was kept submerged in a solution of one of the well-known and popular washes, still contained—as can be seen by Dr. Bergey's report—five different species of bacteria.

There is little doubt that every person of hygienic habits keeps the tooth-brush as clean as ordinary means will permit, but, in view of the investigations herein recorded, is it not necessary to do something in addition to rinsing the brush and putting it away until required, usually in perhaps the most unhygienic quarter of the house?

FIG. 6.



Brush No. 6 (Fig. 6).

Bacterium lacticum.
Bacillus cereus.
" vulgaris.
Micrococcus aureus.
" salivarius.

A COMBINATION PLATE-OBTURATOR.

By JOHN H. MEYER, D.D.S., New York, N. Y.

BEFORE going into detail regarding my appliance I wish to state that the gentleman for whom it was constructed became a patient of mine in 1884. At that time there were eleven teeth present in the maxilla. The patient was wearing a rubber plate covering a palatal perforation two inches in length and one in width, and carrying the missing teeth.

As the vulcanite plate kept the edges of the perforation constantly inflamed, I made a gold plate which obviated the trouble; but as years went on one tooth after another dropped out, making it necessary to change the position of the clasp and to attach additional teeth. Finally, the plate being supported by two molars only, I began to lighten the burden by cutting away all the artificial substitutes with the exception of the six anterior teeth. By this time I had partially made up my mind to crown the lower first molars and to attach spiral springs to them in order to support the upper plate; but, before I had fairly started to carry out this plan, another tooth dropped out. Now the only support was a loose second molar. I made this tooth as secure as I could by packing soft gutta-percha around the roots, and proceeded to take an impression in my usual way, avoiding the loose tooth as much as possible. The idea of utilizing the perforation came to me after the plate had been swaged.

About two years after the construction of the appliance which I am about to demonstrate—namely, in 1893—my attention was called to an illustration in Dr. Kingsley's work on Oral Deformity, bearing on the question of cleft-palate prosthesis. In 1541 Ambroise Paré made a similar appliance, which was published and illustrated by Pierre Fauchard in 1728, and which the latter describes as having been a plate which covered the fissure. In the center of the plate a tube was attached, and through it a screw was passed leading to the upper part of the plate and supporting two wings. When folded together the wings would pass through the fissure, and when the artificial plate was in place the screw-head was turned with a pair of forceps and the wings were spread across the fissure in a way that would cause them to rest on the nasal surface of the roof of the antrum of Highmore. The wings had each a small piece of sponge attached to their under surfaces, that readily adapted itself to the surface with which it came into contact, and thus the pressure of the wings on the tender mucous membrane could be tolerated.

The principle upon which I constructed my appliance is similar to that of Ambroise Paré, and differs from the original in one respect only. I obtained an impression of the upper border of the floor of the maxilla, and vulcanized hard rubber wings to fit accurately the floor of the border. I also used a new locking device of my own design, operated by the patient's thumb, by means of which the plate can be adjusted or loosened. The whole attachment can be removed in case of repair to the plate proper.

This appliance has been successfully worn since July 1901.

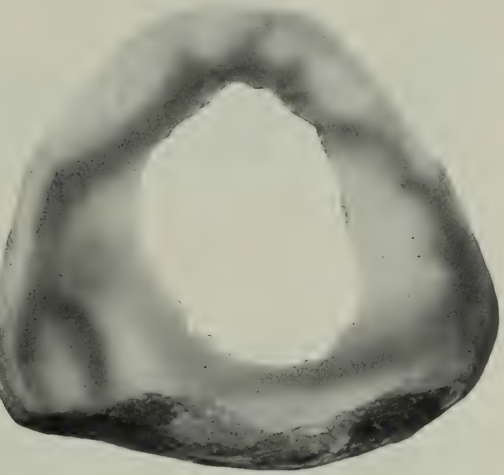
MODE OF CONSTRUCTING THE PLATE.

I obtained the impression in my usual way—namely, by first taking one in wax in order to obtain a cup to fit the mouth more accurately. I then removed a sufficient quantity of the wax and substituted for it a thin coating of plaster, in order that not more than an insignificant amount of plaster should enter the perforation.

From this impression a model was prepared showing the perforation. (Fig. 1.) I filled with wax and contoured the perforation in harmony with the rest of the model. A gold plate was then swaged in the usual way and fitted to the mouth. I then proceeded to take the impression of the cavity by placing plaster of a creamy consistence, with the aid of a suitable spatula, on the upper floor of the border and against the wall of the cavity, keeping the plaster even with the edge of the perforation, and carefully placing a thin layer on the posterior part in order to avoid the soft palate. Before the plaster began to set I made three incisions to facilitate the breaking and removing of the mass and also for future reference.

Now imagine yourself looking into a plaster cavity. When this plaster was fairly hard I applied shellac varnish, and when it was dry oiled it. The plate was now warmed, and upon it at the site of the perforation some wax was placed in order to thus secure an attachment for the plaster. On this wax I placed fresh plaster, which was carried up against the plaster dome, so as to secure an impression of the surface of the dome. When the latter had hardened, the plate with the plaster on it was removed. This gave a perfect impression of the surface of the plaster dome at the point of incision, while the incision afforded me the means of accurately fitting the plaster dome to the plaster on the plate. From this I prepared the models upon which the appliance was constructed. The "holding part" of this appliance was constructed in the following manner:

FIG. 1.



A piece of solid round gold wire $\frac{4}{16}$ inch thick and two pieces of wire $\frac{2}{16}$ inch thick were soldered to the upper part of the plate. The wire was cut to the required length, and a screw-thread was cut in the small posts. (Fig. 2.)

A gold plate of No. 22 gage, $\frac{1}{2}$ inch in length by $\frac{3}{4}$ inch in width, was then prepared to receive the movable wings, and was screwed to the small posts. The wings, which were made of pieces of gold plate of No. 22 gage, were covered with soft wax and pressed down on the upper border of the cavity in order to secure a perfect adaptation, and were then trimmed to the desired size and shape. A hole of $\frac{3}{16}$ inch was cut through the large wire, and gold plate screwed to the small posts for the admission of the lever, which was made to fit the opening. (Fig. 3.)

Fig. 2.

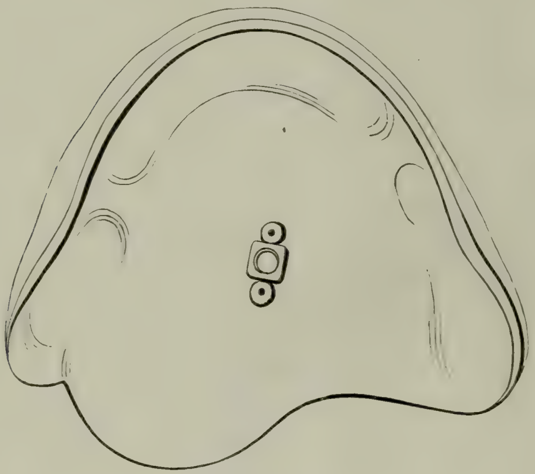


Fig. 3.

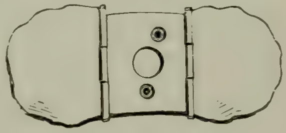


Fig. 4.

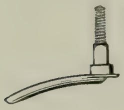


Fig. 5

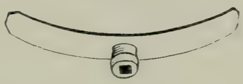
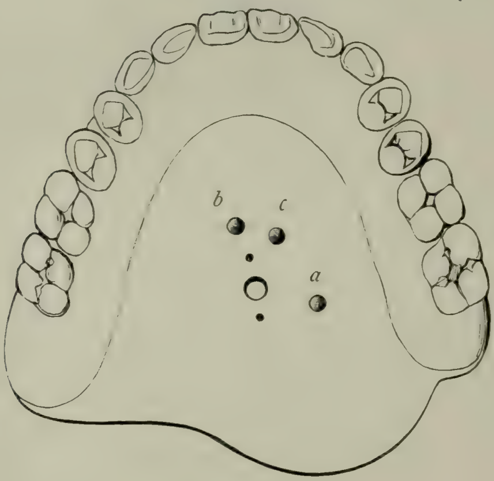


Fig. 6.



A square shoulder was cut on the short arm of the lever above the round part, to which the locking bar of the appliance was attached. The end of the short arm of the lever was cut thin and screw-threaded, and, being supplied with a small nut, it constitutes the means of locking the wings. (Fig. 4.) The locking bar was made of clasp gold No. 29 gage and was $1\frac{1}{2}$ inches in length and $\frac{5}{8}$ inch in width, and had a wire $\frac{4}{16}$ inch thick soldered in the center and underneath the bar. (Fig. 5.) Through the latter wire a square hole was cut to fit the square shoulder on the short arm of the lever. The long arm of the lever was fitted to the contour of the under surface of the plate, and the lock was operated at this point. Three protuberances were soldered on the outer surface of the plate, as shown in Fig. 6.

The appliance is unlocked at *a* and

locked at *b*, and the projection shown at *c* was for the purpose of allowing the lever to spring over and to prevent it from working backward during mastication. The lever is operated from left to right with the aid of the patient's right thumb. The appliance is inserted with the wings folded together (Fig. 7), and when the lever is turned from *a* to *b*, the locking bar passes over the wings and locks them securely in a horizontal position. (Fig. 8.) In this way the plate can be adjusted or loosened at will.

The above appliance was made with one loose molar in position, which was not extracted until the appliance proved a success, about ten days after its insertion.

The usefulness of the plate-obturator is self-evident, and its range of applicability extends to all cases of perforation of the hard as well as the soft palate where no teeth are present. The soft palate can be restored by means of a velum attached to the plate, and it matters not if a border be left in the cavity. Any number of wings controlled by one single key can be made to fit any part, and the whole appliance can be made entirely of vulcanite.

FIG. 7.

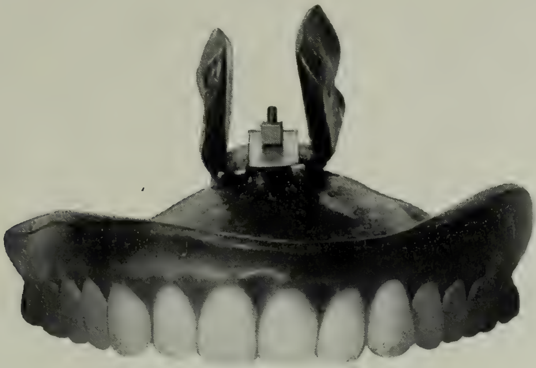
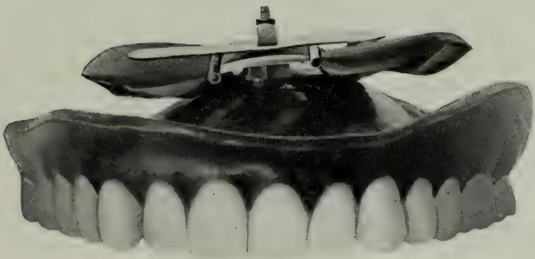


FIG. 8.



A CASE OF REGULATING AT FORTY.

By A. K. JANSON, D.D.S., Dresden, Germany.

I DO not present this report to the profession with any presumption at speaking as an authority on the subject of orthodontia, but simply as one who is greatly interested in the subject, and from a desire to record some gratifying results.

Fig. 1.

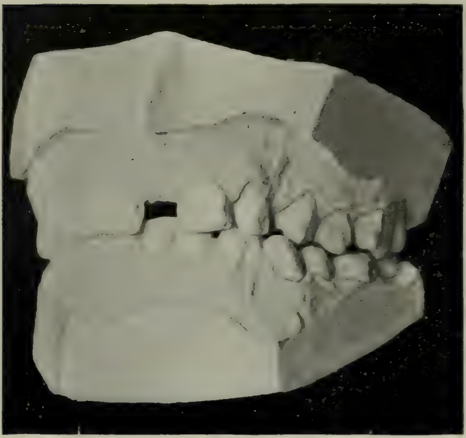
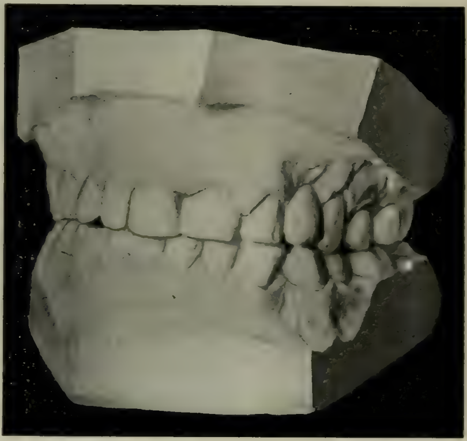


Fig. 2.



In October 1905 Mrs. K. came to me presenting the condition shown in Fig. 1. As is plainly seen, the upper left canine is absent, it having never erupted, and as a consequence the upper left central and lateral incisors have moved distally, causing the hideous space between the two central incisors and giving a one-sided appearance to the face.

Considering her age I was a little doubtful if success would follow an attempt at correcting the deformity, but I saw no reason why the teeth could not be moved under gradual stress carefully applied.

I therefore proceeded to band the left central incisor, soldering to the band a small tube running parallel to the long axis of the tooth. Then the right lateral incisor was banded, and to the band a tube was soldered running horizontally or mesio-distally. A traction screw was then fitted into the tubes with the nut on the distal side of the lateral incisor. In this way I availed myself of the resisting power of the right lateral and central incisors, thus drawing the left central into place without changing the position of the other teeth. Owing to the age of the patient great care was used to move the tooth very slowly, as otherwise an inflammation might have resulted. It required about two months before the left central incisor was in its proper place. It was wired firmly to the other teeth while the lateral was being moved to place, which movement required about six weeks. This was accomplished in the same manner, the only difference being that the traction screw was used with pushing force, by having it attached to the bicuspid, in order to prevent the other teeth from being under too great a strain.

The force in each case was applied about midway between the crown and the root, the tubes extending slightly above the gingival border in order to bring the teeth bodily through the process and to prevent any unnatural tipping of the crown. A bridge was then made consisting of an artificial canine, to act as a retaining appliance; another bridge was inserted on the right side, and when the patient was discharged the arches were as shown in Fig. 2.

Another peculiar feature of this case was the presence of a small hard swelling on the palatal surface immediately behind the left central incisor. This enlargement upon being opened was found to contain the root only of the missing canine, the crown having been absorbed by the tissues.

In view of the age of the patient it was deemed advisable to disturb as little as possible the relationship of the two arches, and while in the case when completed the occlusion was far from being perfect, the result of the treatment above outlined can justly be regarded in the light of a success, as the patient's facial appearance was greatly improved.

CROWN AND BRIDGE WORK.

By D. O. M. LE CRON, D.D.S., M.D., St. Louis, Mo.

(Read at the thirty-seventh annual meeting of the Pennsylvania State Dental Society, Philadelphia, June 27, 1906.)

THIS very alluring subject which your committee has assigned to me has been so thoroughly covered in all its many variegated and protean aspects that at this day little that is new remains to be said.

The advances made in crown and bridge work during the past twenty-five years have aroused an enthusiasm in prosthetic dentistry which has resulted in placing the profession on a higher plane. With the superior advantages now to be derived from the curriculum of any first-rate dental school, there is no reason why the young graduate as he emerges from the portals of his alma mater should not be thoroughly *en rapport* with the van in the prosthetic procession, especially as regards the different methods of crown and bridge work.

Prosthesis is defined as "the addition of an artificial part to supply a defect," and as applied in dentistry its votaries are required to possess and exercise a degree of skill not demanded of those who would supply deficiencies in other regions of the body. As our work is almost wholly mechanical, we should be thoroughly imbued with and governed by correct mechanical principles. Another factor of equal importance is the possession of the artistic skill by which we may be enabled to approximate nature's inimitable example. We are not all born with mechanical skill and artistic tastes, but these may be acquired to a great degree, if our training be properly directed. To still further raise the status of this branch of dentistry, more attention should be given to manual training. Molding, carving, and handling tools are what we need in order to train the eyes and fingers, and thereby become reasonably skilled artisans.

I am loath to say that too many of the profession depend upon the dental laboratories to do their work, with results that are disastrous to themselves, to their patients, and to the profession.

In crown and bridge work, each operation presents in some degree different requirements, and creditable results are only to be obtained by a proper appreciation of the importance of constantly keeping in mind all the various factors of each particular case, and by so directing our efforts that our artistic sense will have the freest play possible consistent with the mechanical principles involved.

STUDYING PRINCIPLES AND REQUIREMENTS.

Dr. Evans says: "The practice of crown and bridge work by dentists possessing the requisite attainments and governed by correct ethical principles, gives results which have gradually established their value, removing erroneous impressions and insuring a wide professional and public indorsement of this branch of prosthetic dentistry. Its extraordinary facilities for preserving and replacing teeth have made for it a high position in dental art."

If we are to attain skill in this branch, it will be only by study and diligent practice. We must become familiar with the different methods and forms of crowns and bridges, and study the relationships of the several anatomical structures. Failures in this work can be attributed to lack of knowledge of the fundamental requirements of construction. The foundation is the first important step, and must be considered from a mechanical and artistic standpoint; the occlusion and facial expression should next be considered, and then we will be ready to determine what kind of a crown or bridge is indicated.

With the advent of the gold and porcelain inlay, many teeth that formerly were crowned can today be restored by less radical means and made to render good service for years. I would urge those who have paid but little attention to this form of work to look into it more deeply. We have passed the experimental stage, and I can assure you that a test of fifteen years proves that the inlay method is one of the best means of restoring and preserving the tooth-structure. Too many teeth are sacrificed for crowns that should be restored in other ways. Many of the profession seem to have a mania for crowning, and we find these unscrupulous men capping with gold shell crowns vital bicuspids and molars presenting but little indication of decay.

I wish to say here with emphasis that with the exception of peg-shaped teeth, no teeth should be crowned unless so far impaired that the extirpation of the pulp is unquestionably necessary. We should always remember that crowning is the last resort, and our conscience should prohibit us from sacrificing these organs except when absolutely necessary. There are many methods or modifications of methods for the construction of crowns, and each individual has some special system of adjusting and assembling their several component parts.

It is not my purpose to employ your valuable time in going over the technique of the various crowns in use, but merely to present a *résumé* of a few, or rather to make certain suggestions along the lines of our daily practice.

THE PORCELAIN CROWN.

For the eight anterior teeth porcelain crowns are always indicated; not only because of their artistic appearance in imitating nature, but also because I contend that they fulfill the requirements of strength and durability. Unquestionably they are stronger and cleaner than Richmond crowns. If properly fused, they present a homogeneous mass on a rigid iridio-platinum base, while the Richmond facing is held in the place of attachment merely by two small platinum pins, and however accurately adjusted the backing may be to the facing, in the junction of these two parts the secretions of the mouth will ultimately penetrate.

In the construction of a porcelain crown the metal should not be apparent on the labial surface. To avoid this, the labial third or half of the root-face should be beveled so that the free border of the gum will cover the metal. If a band be used, it should be quite narrow at the labial aspect, and the facing should be so ground in adjusting it to the band that it will entirely cover that portion of the latter, and thereby obliterate the blue cast on the gum caused by the reflection of the platinum. For the last few years I have almost abandoned the full band for individual crowns, and have adopted instead the half-band or saddle-back almost invariably. This method I deem most satisfactory if its details are carried out with exactness. In preparing the root for a bandless crown, the tooth is cut off to within one thirty-second inch of the gingival line, which results in a plane surface labio-lingually. The canal is now enlarged for the reception of the dowel post, which should be of iridio-platinum, of requisite thickness and length to correspond to the length of the crown. It should be tapered to a point, and should fit the canal snugly. To obtain the size of the diaphragm, it is well at this point to burnish a piece of platinum No. 32 gage over the end of the root, as in this way we secure a perfect outline of the root-face, which facilitates the shaping of the floor of the cap accurately and gives an indentation showing the position of the canal. After trimming the diaphragm as indicated by its outline on the platinum, and punching the hole for the post, we have a floor that can readily be so adjusted to the face of the root as to obviate mutilation of the gum and prevent giving pain to the patient. The root is now cut down under the gum festoons and shaped labially and lingually to represent a saddle or V-shape surface. For cutting the root under the gingival margin, I prefer to use a good size sharp wheel bur; with this bur in the handpiece and a finger resting upon an adjoining tooth for support, we can cut from the center out to the gum line to whatever depth required without mutilating the gums at all. Instruct the patient that the instrument will touch the gum but that there is no danger of cutting this tissue, and if we have perfect control of the handpiece we can cut the full depth of the free margin of the gum without causing the least flow of blood.

After being satisfied that the root has the proper shape for the reception of the framework, we proceed to adapt the cap and pivot to place. That end of the post extending above the diaphragm, and to which the pins of the facing are attached, is flattened by a few strokes of a hammer. The post is placed in position and the space for the facing is noted; if any bending be required, grip the post with pliers close to the root, withdraw it, place it in a vice, and bend it accordingly. With the diaphragm in proper position on the root, the post is gripped firmly with a pair of pliers and forced into its proper place. The platinum floor is now partially adapted to the face of the root with two flat burnishers. The whole is removed by means of the pliers; the post and floor are attached to each other by a very small piece of pure gold —or better, twenty-five per cent. platinum solder.

It will be noted that the forcing of the post through the base gives the former a sufficient attachment to prevent a change in relations during the subsequent removal and soldering. The piece is again placed in position over the root for final adjustment. This is best accomplished by using an automatic mallet (or a hand plugger when an assistant is available), and, with a large hand gold-plugger in the other hand to hold the base in proper position, it is gently tapped with the mallet until its adaptation to the end of the root is perfect. A bite is now taken with modeling compound or wax, and an impression taken with plaster of Paris. Before pouring the cast, the surface of the pin should be coated with a thin film of soft wax, in order that subsequently it may be readily removed from the cast and replaced at pleasure.

The facing should be so ground that a point will rest upon the extreme labial edge of the floor, and the pins be bent into perfect contact with the post. To facilitate bending the pins, I would suggest drawing a sharp file or ribbon saw over the pins on the under side, quite close to the facing. The sharp indentation allows the pins to bend more readily at a sharp angle close to the porcelain surface, and gives more space for better contouring of the porcelain. Attach the facing to the post and floor with adhesive wax, remove it from the model, and invest and solder the several parts with pure gold or platinum solder. Afterward remove the piece from the investment and subject it to an acid bath in order to remove all traces of foreign matter. Any surplus platinum which would be likely to interfere with the proper contouring of the porcelain should be ground away and rounded off.

APPLICATION OF THE PORCELAIN BODY; BAKING.

In the application of the porcelain, and during the baking, much care and judgment should be exercised, as this is a delicate part of the procedure. Select a body corresponding in color to the facing, and mix it with pure water on a clean glass slab. With a suitable pin-vice grip the post firmly, then apply the body, thoroughly settle it to place by drawing a serrated instrument over the handle of the vice, and take up the excess of moisture with blotting paper. Continue to add body and to take up the excess of moisture in this manner until the desired form is obtained. The piece is now placed in the furnace upon a suitable support and baked. The first baking is not carried to the stage of vitrification, as each subsequent baking would cause this first portion to become over-fused; therefore the surface should only present a very slight glaze. For the final baking, the body is added in like manner, and the fusion is carried to a perfect glaze.

THE HALF-BAND CROWN.

In the construction of the half-band crown the root is cut down to the gum line, and with proper enamel scalers the enamel on the lingual wall is removed, thus forming a parallel wall. Take the measurement of the root with suitable wire, and with 28-gage platinum plate make a full band. Place it in position, adapt it to the root, and with a sharp instrument mark the outline on the band. Remove, and dress down the band to the marked outline, attach the platinum diaphragm—32 gage—to the lingual border with a small piece of platinum solder, shape it to the outline of the band; again place it in position on the root, burnish it, and punch a hole for the dowel post. This gives us assurance that when the front part of the band is cut away and the post forced into position, the lingual portion of the band will be in perfect apposition to the root. The root on the labial aspect is cut down below the gum margin as described in the case of the saddle-back crown, and the band is cut away on the labial side. The piece is now placed on the root, the post is forced into position, and the platinum floor is tapped down as before described. When the band and the floor are satisfactorily adjusted, remove them and solder the pin. The procedure from this point on is similar to that of all porcelain crowns.

BRIDGE WORK.

Bridge work is the natural outgrowth of crown work, and marks the greatest advance in prosthetic dentistry. Mechanical skill is required for its construction, and good judgment to determine its admissibility. There are entire text-books devoted to this important subject. The object at which we aim in this work is utility and esthetic appearance. In determining the indications of the case and methods of construction, there should be no place for guesswork. A reasonable degree of familiarity with the laws of physics is a desideratum, to the end that we may calculate the leverages exerted and determine the direction of the forces applied. We should thoroughly familiarize ourselves with the working capabilities of the metals used. We should know their limitations, and what we may expect to accomplish with them.

For the benefit of beginners, I will say that whatever success I may have had with this class of work was due to unremitting practice and a determination to become a master of the metals and materials with which I had to deal. We should keep in mind the laws applying to force, and consider the forces of mastication as they are related to individual cases. We should remember that in shaping the abutments they should be formed so that they will stand perfectly parallel to each other. We should study every little detail as a matter of routine, to the end that our judgment may be sustained and success crown our efforts.

Remember the motto of Morris, "Not how cheap, but how good," and that Emerson said, "If a man shall do a piece of work incomparably better than his fellows, the world will make a pathway to his door though he live in a forest." The most varied and complicated cases present themselves to us in practice, cases that no one method will cover, and in the solution of which we are called upon to exercise our inventive talent to the utmost. The highest success presupposes a comprehensive grasp of the underlying principles.

Many bridge-work methods are advocated, and as most of them have some good features, it is well for us to become familiar as far as possible with all. By so doing we have a more comprehensive knowledge of the art, and a wider range to determine what is best suited for the case in hand.

I will not go into the detail of the various systems, but will confine my remarks to the inlay or post-anchorage bridge that I have for years been practicing with gratifying results. It must be understood that extensive pieces are not suggested for this particular class of work; though I have in many cases in which the two bicuspids were missing used the canine for the post inlay pier, capping the molar with a shell crown. I have also replaced two of the anterior teeth in like manner, making both abutments post inlays. In many cases where a single tooth is missing, this method affords most satisfying advantages, if for no other than esthetic reasons. In forming the cavities for the abutments, we follow the lines laid down in cavity preparation for inlay work, namely, flat base, walls absolutely parallel for purposes of retention, and of sufficient depth in order to secure the greatest strength for the attachment. In preparing the cavity for an anterior abutment, the lingual portion of the tooth will be cut away sufficiently to allow for the passage of the post of iridio-platinum wire, which enters the root-canal, and the cervical wall should extend to or under the gum margin. The labial wall of the cavity must be parallel with the post, or rather slope from the canal to the incisal edge in order to permit of its removal. With a fissure bur a groove is cut from the root-canal to the base of the cavity, extending to the lingual margin; also one on the labial wall from the base to the incisal edge for retention purposes. The formation of the cavity is such that the inlay or abutment will not be misplaced by the force of mastication. Undercuts must be avoided, as in all inlay work, and if any should exist, fill them in with cement to avoid the warping of the matrix during its removal.

In preparing the cavities, great care must be exercised to have the walls of the cavities and the posts of the canals of both abutments perfectly parallel to each other. This is best accomplished with a parallel gage. Its use makes every step positively accurate. The piece when completed requires no further adjustment, and is readily placed in the position it should occupy. Many failures in bridge work can be attributed to this most vital point, and too much stress cannot be placed on making the piers absolutely parallel.

If we wish to utilize a bicuspid or a molar for an inlay abutment, the cavity must be formed according to the principles laid down for cavity preparation for inlay, viz, parallel walls and deep flat seat, and should be so shaped as to afford sufficient retention.

The cavity should be extended labially and lingually in all cases to secure the required surface for the attachment of the dummy. The retention can be made either by ingeniously forming a dovetail, or by countersinking or cutting a groove at a suitable point so that the inlay when completed may at this point have a tenon, as it were, to enter the mortise or groove.

I have prepared plaster models representing the above forms, so that you may more readily comprehend the formations, and will pass them for your inspection. The inlays are made of gold-plated copper and brass. The one in the canine represents a solid gold inlay and the bicuspid a hollow inlay. In passing, I wish to say that the hollow inlay should never be used for an abutment, as the solid one is stronger for this purpose. In forming the matrix, many advocate burnishing it directly in the cavity; for myself, I obtain better results by securing a sharp impression with cement or modeling compound, and by packing it with copper amalgam. When sufficiently hard, the matrix can readily be adjusted and trimmed roughly to the outline of the cavity, and it can then be carried to the mouth for the final burnishing and perfect adjustment. When satisfied that the matrix is accurately adapted, fill it with wax, and if it be necessary to obtain a bite instruct the patient to close the teeth, thus securing the means of forming the inlay, fulfilling the requirements of perfect occlusion.

Remove the wax-filled matrix and invest it just to the edges of the metal, to prevent it from being warped in handling. The wax is then shaped on the masticating surface to the required occlusion, and heavy gold foil is burnished over it. The whole is invested, the wax is boiled out, and the space previously occupied by it is filled with 22-k. gold solder; or in lieu of this it can be packed with moss fiber gold and the solder flowed into the gold, as the moss fiber gold most readily takes it up. The inlays are placed in their respective positions, the bite and impression are taken by the usual method, and are placed on the articulator. The dummies are constructed and the posts assembled as for any other bridge. It is advisable in making the final investment to paint the back of the inlays with yellow ocher, whiting, or some suitable substance to prevent the solder from flowing on the under surface of the inlay.

The soldering problem is a great ordeal to many of the profession, and few seem to realize that sufficient heat well distributed is necessary. Success in soldering depends on all parts being clean and the heat being equally distributed under and around the investment sufficiently to cause the solder to flow.

A FEW SUGGESTIONS.

In closing, I wish to make a few little suggestions, and though many of you no doubt are already familiar with them, I will describe them for what they may be worth, and maybe some few will be interested. First, the use of staples formed from iron wire set in the crowns or placed in the abutments after the impression is taken, pouring the plaster over them. It strengthens the abutments, and allows us to cut all the plaster away to the bar of the staple without fear of breaking the assembled parts of the work that are merely held by wax. It also makes possible the use of smaller investments, and prevents them from checking from the excessive heat. Second, if any fear should exist of checking the facing or changing its shade in soldering, the facing can be removed during this procedure after all the parts are assembled and ready for investment. Heat a small instrument, press it gently against the platinum pins of the facing, and the latter will readily be forced out. We then insert small graphite points, such as are used in gold pencils, in place of the platinum pins, allowing them to extend out from the backing say one-fourth of an inch, in order that they may be engaged by the investment. After the soldering is completed, the graphite is bored out, and the hole countersunk, the facing placed in position with cement, and riveted. Third, a convenient and inexpensive holder for polishing gold crowns can be constructed out of the ordinary clothespin, as suggested by Dr. Linnert of Warrington, Mo. The ends are cut down to such a size as will permit of their being inserted into the band of the crown. When the forks are pressed together, they will spring outwardly against the inside of the band, and will hold the crown securely during the polishing.

RESTORATION OF GUM TISSUE ON THE LABIAL ASPECT OF TEETH.

By A. W. HARLAN, M.D., D.D.S., New York, N. Y.

(Read at the union meeting of the Maryland State Dental Association and the District of Columbia Dental Society, Washington, D. C., June 8, 1906.)

THE gums are provided with a network of vessels, arterial and venous, so that repair takes place with great rapidity after an injury. This is not so strikingly apparent when they have been thinned by friction and infective processes, to say nothing of constitutional maladies past or present. The causes of recession of the gums are well known, *i.e.* extraction of teeth, deposition of salivary and serumal calculus, careless use of clamps and ligatures, regulating appliances, files, disks, tweezers, toothbrush, malposition of a tooth or two, use of sialogogues, or other remedies affecting the sockets of the teeth. Prolonged illness, defective assimilation and nutrition may also be reckoned as factors in causing recession of the gingival tissues; some of the exanthemata, syphilis, and necrosis of alveolar margins are likewise responsible for this disfigurement.

When we find recession uniform along the necks of the teeth it is generally due to the action of organisms which excrete an irritating fluid, and the gum tissue is invaded and torn down and liquefied as a result of their presence. Nothing will avail in these cases save the scraping and cutting and tearing of the whole surface of the gingival margins surrounding the tooth. The necks of these teeth should be cleaned and polished carefully, and if they are very sensitive, a ten to twenty-five per cent. solution of silver nitrate should be applied to each. The discoloration will soon disappear, and this agent is more effective than zinc chlorid, potassium carbonate, or copper sulfate. I have used all of the silver salts locally in such cases, but the nitrate is the most satisfactory one. None of the compounds of sodium or magnesium give any permanent relief; they are all good for temporary use only. If one should wish to make a profound impression on the gum tissue itself, dry it, and apply a twenty per cent. solution of mono- or trichloracetic acid with a camel's-hair brush; after a few minutes the patient should rinse the mouth carefully with milk of magnesia or sodium bicarbonate. In order to prevent thermal shocks take of tin oxid one-half ounce, of Spanish whiting one-quarter ounce, and of glycerin a sufficient quantity to make a paste, and with a good buffer rub and polish the necks of the teeth for from one to two hours. To accomplish this I use pieces of rubber tubing stretched over a back-sloped mandrel. It will be found very effective and agreeable to the patient.

Recession of the gum on the labial aspect of a tooth, incisors or canines, may be very disfiguring, especially in the mouth of a lady, or of a man whose teeth are not hidden from view by a mustache. These cases require much care and delicate handling to effect a cure. I have spent as long as two years in restoring gum tissue over a canine or lateral incisor. In order to be successful the tooth should not have a filling on the neck, and if there be a filling of gold it should be removed and substituted by a porcelain inlay. If the glaze of the inlay is ground off, one may succeed in covering a portion of it with the gum, but at best there will be no attachment of the gum to the porcelain, although the gum may hug the neck of the tooth very closely.

In all cases where there is a recession of the gum and the neck of the tooth is free from caries, I first cleanse the surface of the exposed root and carefully dissect the gum from the root to about one-quarter to three-eighths of an inch in depth, carefully wiping away the blood, keeping the mouth open until the hemorrhage ceases spontaneously or through the use of an adrenalin solution. I then make three incisions into and through the gum tissue. When the bleeding has almost ceased, I fill these cuts with dried zinc iodid, allowing the blood to liquefy it so that it may be carried around the gingival margin. This will create a profound irritation of the gum, which must be left undisturbed. The patient should use for a few days some mildly antiseptic wash—an antacid one—composed of such agents as sodium bicarbonate or milk of magnesia. After the lapse of three weeks the scar tissue which will grow in these incisions will be hard enough to permit of repeating the operation in a new locality. The exposed face of the root should be roughened to permit of the close adherence of the gum to this surface, as it is slowly pushed downward over the root. If we exercise great care in selecting the site of the first operation, the latter can be repeated at least four times, at intervals of from three to four weeks. The gingival edge of the gum may be irritated with zinc iodid, zinc sulfate, or copper sulfate, at intervals of four to seven days. When it is difficult to keep up the irritation, I take a silk ligature and tie two or three or more knots in it around the roots, or fasten some pure silver wire around the tooth, not quite firm, so that it will move a little and keep up the irritation. This will make the gum project downward along the exposed neck of the tooth, and over it. The gum is to be looked after carefully, and if it should become too irritated, paint it with one part adrenalin and three parts compound tincture of iodin once in three days. I use as a wash

Hydronaphthol,	gr. xx;
Oil eucalyptus,	♏x;
Oil cassia,	♏x;
Alcohol,	℥iij;
Distilled water,	℥xiij. M.

Sig.—Use freely five or six times daily, diluted if necessary with more water.

The gums should not be brushed for several days after operating.

This method of treatment may be applied to the receded gums in the interproximal spaces, as well as upon the bicuspids when exposed to view. It is very important that the exposed cementum be roughened by a groover or a bur that cuts shallow grooves at right angles. The simple soluble dentifrice should be used for a time, at least, as all insoluble powders tend to collect under the free margin of the gums and prevent attachment to the denuded root.

SOME OF THE PHENOMENA OF COLORS IN PORCELAIN INLAY WORK.

By **J. Q. BYRAM, D.D.S., Indianapolis, Ind.**

(Read before the Dental Society of the State of New York, at its annual meeting, Albany, N. Y., May 11, 1906.)

IT is rather unfortunate that an essayist must preface his paper with an apology, but I feel that one is due this society. When I accepted the invitation of your esteemed president to repeat a lecture on "Color Problems in Inlay Work," which was delivered before the union meeting of the Seventh and Eighth District Dental Societies of your state, I did not realize how difficult it would be for me to express the same facts differently; so, after burning some midnight oil trying to disguise the former paper, I gave up in despair, and used extracts from the original essay. While the present paper treats of some color problems in general, it is hoped that their application to inlays may be of some value.

Light has been defined as that form of radiant energy that acts on the retina and renders visible the objects from which it comes. Every object seems visible either because it gives out light of itself (is self-luminous), or because it reflects light from its surface (is illuminated). The light of the sun or the flame of a lamp are examples of self-luminous bodies, which emit luminous rays in all directions. Light emitted from the sun is said to be white light, while that from artificial sources is said to be colored light.

Color is a sensation produced in a variety of ways, but pre-eminently by the action of light on the retina. The specific effect produced depends upon the character and combination of rays that reach the retina. The relation of color to light is much the same as that of music to sound. It is not the mere sound that gives to us so much pleasure, but when it is developed into its highest form, music, we are pleased beyond measure. And so it is with light. When we think of the varied ways it combines and of the pleasure that these combinations afford, we can hardly help viewing the many color harmonies of nature with wonder and satisfaction.

RELATION OF PIGMENTS TO LIGHT.

Some of the phenomena of light which assist in producing colors from pigments are absorption, transmission, and reflection. If a transparent body absorbs certain colored rays and transmits others, it will appear colored from the combination of the transmitted rays. A translucent body transmits, reflects, and absorbs rays, and its color is determined by the different quality of light reflected or transmitted. If light penetrates a short distance into a body and is then reflected, its surface generally appears to have the colors of the reflected rays. Light is not transmitted by opaque substances, but the rays are either reflected or absorbed. When light is incident upon an opaque body, it is wholly excluded from the other side, being absorbed by or reflected from the surface.

While all pigments have the power to reflect or transmit light, it is their power to absorb certain rays that assists in producing color. This is commonly spoken of as selective absorption, and the colors of stained glass, porcelain, etc., are examples of this phenomenon. Red pigments reflect or transmit red, yellow, and orange rays, and absorb violet, blue, and green rays. Yellow pigments transmit or reflect red, orange, yellow, and green rays, and absorb blue and violet; while blue pigments transmit or reflect green, blue, and violet rays, and the remaining rays—red, orange, and yellow—are absorbed by them.

When red, orange, yellow, green, blue and violet rays are combined in proper proportions, white light is formed, while black results from the mixture of red, orange, yellow, green, blue, and violet pigments mixed in proper proportions. The first phenomenon is caused by the combining of colored light by a process of addition of rays, and the second is a result of adding pigments and subtracting light, for all the rays transmitted are absorbed or quenched by another pigment.

One of the most prevalent theories of color formation from pigments is known to artists and colorists as the "Brewster theory of color formation." It treats red, yellow, and blue as the primary colors. According to this theory the many colors used by artists and colorists may be made from these three. When two of these primary colors are combined, secondary colors are formed. Red and yellow, for instance, give orange; red and blue yield violet; and yellow and blue produce green. By combination of the three primary colors so that complete absorption of light takes place, black is formed. The colors produced by the three primaries are termed tertiary colors. The third primary color, however, does not produce a new hue, but merely saddens the other two by forming a certain amount of gray or black in the combination. They are often termed the dulled or broken tones of the primaries or secondaries. Orange and violet produce a reddish brown. Green and violet produce a bluish gray. Green and orange combine to form yellowish brown.

QUALITIES OF COLORS.

Colors have three principal qualities, known as hue, purity, and luminosity. These are generally spoken of as constants. The excessive predominance of one color over another yields the *hue* to that color, and the greater this predominance the stronger will be the hue, *e.g.* when blue and yellow are mixed, green is produced. If yellow predominates, the result is green with a yellowish hue; but if blue predominates, the green will have a bluish hue.

The *purity* of a color is its lack of mixture of white or black, or of any of the colors. These not only weaken the color, but change its character. This can be shown by adding white porcelain to yellow. The yellow is not only diluted but tends to take a hue.

The *luminosity* of a color is measured by the amount of light reflected to the eye, and is therefore independent of hue or purity. The most luminous color is yellow, while the least luminous is violet, and between these extremes are all the intermediate degrees of brightness. In those teeth where light yellow and blue predominate they appear more translucent, because they reflect and transmit the rays; while in those teeth where gray and brown predominate they have somewhat of a dull appearance, because their power of reflection and transmission of light is not so great, for more of the rays are absorbed on the surface.

COLORS CONCERNED IN INLAY WORK.

The pigments most commonly used in the manufacture of dental porcelain are precipitated gold, platinum, purple of Cassius, the oxids of gold, titanium, manganese, cobalt, iron, uranium, and silver. The colors produced by the use of these pigments in varying proportions are red, yellow, blue, green, brown, and gray.

Red is not used extensively by inlay workers. All gum enamel frits are tints of red. It may be added to brown to increase its luminosity. Its tints should be used to build that portion of inlays on the labial or buccal surfaces which extends rootward beyond the gingival line.

Yellow is the most luminous of the colors, and is the color used most by the porcelain inlay worker. It should be used to form the body of most inlays to replace the dentin. It adds brilliancy to the browns, or grays, when added to them. Yellows of a greenish hue tend to lose their luminosity in yellow light, while yellows of a reddish hue are most luminous. Two yellows in their deeper tones may match each other perfectly, but when diluted to give lighter tints they may differ quite widely; one may be of a greenish hue, while the other may tend toward a red.

Blue is used to build the body for the incisal or occlusal portion of the inlays for those teeth with blue incisal edges or cusps. It may be added to grays with a bluish hue to intensify them. There is a variation in tone from blues with a greenish hue to those with a reddish hue. Blues with a greenish hue are more luminous and appear to be more translucent.

Green is seldom used alone, but it may be added to yellow to give it a greenish hue, or to blue to increase its translucency.

Browns should be used to build the gingival portion of some inlays, and also for the body of the inlays for discolored teeth with a brownish hue.

Grays are principally used to build the middle and incisal or occlusal portion of those teeth with a grayish hue. They are also used to sadden yellows and blues.

The intensity of a color is conditioned by the intensity of the pigments and the thickness of its layers. Two or more shades of a color can be made of the same porcelain by varying the thickness of the body. Knowledge of this fact is important in the application of porcelain in layers; for, after porcelain has been applied and fused, it is often found that the color is changed. The trouble may arise from this: the layer of enamel is so thin that it is highly translucent and the underlying layers are readily reflected through it.

"MATCHING" COLORS, AND THE SHADOW PROBLEM.

One of the phases of inlay work which will always be perplexing is the difficulty in obtaining colors that accurately match the natural teeth. When we consider that teeth are composed of both organic and inorganic materials with a variation of their density, and that they are colored with pigments peculiar to them, we can readily understand how difficult it is to match tooth-structure with a substance inorganic in its composition, differing in density, and colored with different pigments.

The variation of colors so often noticeable when an inlay is cemented into its place is also quite perplexing. The inlay may be a good match when the incidence of light is at such an angle as will permit its transmission. But when the angle of incidence is changed, some portion of the inlay may appear of a different color.

The cement is the chief factor of the color problem in this phenomenon. If it were transparent, it would not prevent the passage of the light through the tooth. If light penetrates a short distance into a body and is then reflected, the surface generally appears to have the color of the reflected rays. But since light is not transmitted by an opaque substance, the rays are either reflected or absorbed. Whenever light is incident upon an inlay, it is excluded from the dentin on account of the layer of cement, which forms an opaque body, and the color of that portion of the tooth and inlay which is in contact with the cement may differ from the other parts because of the unequal absorption and reflection of the rays.

The question of the color of cement to use for setting inlays has been considerably discussed. When inlays are constructed of a monochromatic porcelain and are slightly lighter than the tooth, a cement which is of the same color as the porcelain, but of a lighter hue, is the best for setting them; for the rays that are transmitted through the porcelain are not absorbed by the cement, but reflected to the surface with practically no change of color other than intensifying it. I have contended for some time that a pure white cement would be the best for setting all simple approximal and approximo-incisal inlays constructed of multicolored porcelain, because white bodies do not absorb light but reflect it. The same rays that are transmitted to the cement would then be reflected to the surface, for white has a greater reflective power than any color. Unfortunately, the manufacturers are unable to produce a pure white cement, and therefore we cannot entirely overcome the change of color caused by the cement's dimly reflecting and partially absorbing the transmitted rays, when the incidence of light is at such an angle that the unabsorbed rays cannot be transmitted through the porcelain.

Another difficult problem is the formation of a shadow. When the light is incident on the teeth or lips, it is partially excluded from all or a portion of inlays in some locations, and this causes the inlay to appear much darker. This fact should be recognized when selecting colors for an inlay. The color of the tooth should be studied with the incidence of light at different angles and with the lips partially covering the tooth. In selecting colors for inlays in the distal surfaces of laterals and canines, the shades of the color should be lighter than for inlays on their mesial surfaces.

A study of the colors of the teeth should be made before the porcelain for the inlay is selected. While the pigments of the tooth determine its color in a measure, the thickness of the dentin and enamel and the density of these tissues, with their power to absorb, transmit, and reflect light, are also factors. The colors of most teeth containing no foreign pigments are yellow, blue, brown, and gray, with a yellowish or bluish hue. Normal dentin is some hue of yellow, while enamel contains a variety of colors.

In the selection of colors for an inlay, note the variation of color in the natural tooth, in which three or more colors or hues of colors are usually found. The foundation, which is that portion of an inlay replacing the dentin, should be yellow (presuming the tooth to be vital), and the enamel, or colors which replace the enamel, should approach the colors of the tooth in their respective locations. The thickness of the layer of enamels governs the intensity of color, and in most cases quite intense colors should be used. There is a difference of opinion regarding the application of porcelain for inlays, and this has resulted in different methods of applying the porcelains in the construction. Some prefer to apply the enamels in layers, some prefer to mix the colors, while others prefer to construct them by using porcelain of a lighter hue than the tooth and coloring the cement with pigments to approximate the color of the tooth.

The method of using porcelains of a lighter hue seems to have no advantage except for labial cavities, and it is open to criticism. It may be advantageously applied, however, in labial cavities where the angle of incidence is always such that some rays are feebly reflected and others are partially absorbed by the cement. It seems hardly possible to construct inlays for approximo-incisal cavities requiring two or more colors by lightening the porcelain and coloring the cement to match the colors of the different sections of the tooth. There is a sameness of color in these large inlays that is objectionable.

The method of building inlays in layers is probably the most popular, and seems to have many advantages. Enough foundation body to approximately replace the dentin should be used and fused. Care should be taken in the application of enamels to prevent porcelains of different colors from becoming mixed while applying them to their respective positions. The colors should be applied separately and biscuited, then a uniform color should be applied over the entire mass and fused. If the colors are applied intensely enough to reflect through the uniform color there will be a harmonizing of colors, and each color will preserve its identity and approach more nearly the natural tooth-structure in appearance. This method obviates the necessity of using porcelain of a lighter hue and adding pigments to the cement. It also breaks up the uniformity of color so often noticeable when an inlay is constructed of a monochromatic porcelain.

MIXING COLORS.

There are conditions under which I deem it advisable to mix colors in the construction of inlays. The yellows may need to be toned with grays, the grays to be brightened by the addition of yellow, or the blues may be lightened by the admixture of a green or saddened by the addition of a gray. While it is unnecessary to mix colors in the construction of most inlays, there are cases, however, in which I find that the mixing of colors gives better results than I can obtain by applying them in layers.

In mixing two porcelains or in applying them in layers it must be borne in mind that the formation of the color is primarily due to the power of the combined porcelain to absorb, reflect, or transmit light. When two colored porcelains are mixed, or when they are applied in thin layers, the resultant color is that which is reflected or transmitted by both colors in common. When two colors, as blue and yellow, are combined, it is found that green is the only color common to both of them, and it is therefore freely transmitted or reflected, the others being absorbed. If a layer of blue were placed over a layer of yellow, the light in passing through the blue porcelain loses its red, orange, and yellow rays, which are absorbed, and are therefore not transmitted, while green, blue, and violet are transmitted to the yellow, which absorbs the blue and violet, leaving the green to be transmitted or reflected. The purity of the green is conditioned by the purity of the yellow and blue and the thickness of the layers. When blue is used to build the incisal portion of an inlay, the yellow foundation should extend only to the point at which the blue is to begin, for if the blue is applied over the yellow it will have a greenish hue. When yellows or blues are applied over grays or browns, the underlying colors have the effect of saddening the overlying ones because the transmitted rays from the yellow and blue are largely absorbed by the gray or brown.

I believe the method of constructing inlays of two bodies differing in density and fusibility to be the correct one. The foundation body should be not only of a higher degree of fusibility, but it should be of coarser texture than the enamels. The coarse foundation body can be thoroughly fused, and when the enamels are added to their respective locations and fused, the two porcelains will give a more natural combination of color than can be produced by a single body.

In applying the enamels over the foundation, each layer should be fused to a high biscuit only, and the heating of the porcelain to the point of glazing should be accomplished at the final fusing; for in the process of applying porcelain in layers and fusing each layer, the underlying layers will be slightly overfused and somewhat lighter in color.

The purity of colors in porcelain is partially dependent upon the accuracy of the fusing. The variation of the heat of the muffle will cause difference in the shade of the porcelain. Underfused porcelain is of a duller hue and less translucent, the blues appear lighter in color, and the yellows, browns, and grays appear darker, than in properly fused porcelain; overfused porcelain is much lighter in color and has more of a glass-like appearance.

It is to be regretted that so few dentists are inserting porcelain inlays. The majority seem to be content to wait until the system of construction is perfected. The technique may be perfected so that better fitting inlays can be constructed; and an adhesive, insoluble, transparent cement which will solve the problem of their retention may be discovered. But success in inlay work does not depend altogether upon those conditions. To construct inlays in the most artistic manner requires some knowledge of the principles of color formation.

CORRESPONDENCE.

THE RECENT FATALITY UNDER ANESTHESIA: A CORRECTION.

To the Editor of the Dental Cosmos:

Dear Sir,—My attention has been called to a note which appears on page 839 of the issue of the Cosmos for August, following an article by Dr. Friedland, entitled "Shall We Abandon Nitrous Oxid for Ethyl Chlorid or Somnoform?"—in which article he had made the statement that he had heard of no death due to somnoform, direct or indirect.

In the subsequently appended note, however, he makes reference to the article which appeared in the *New York World* in its issue for April 23, 1906, reporting a death in my office "following the administration of somnoform."

I wish to deny the statement that a death occurred in my office in connection with the use of somnoform, as the fact is that *no somnoform was administered in the case at all.* Cocain and adrenalin alone were used.

Yours respectfully,

Beaman Douglass, M.D.

New York, N. Y., August 9, 1906.

THE OLDEST DENTAL SOCIETY.

To the Editor of the Dental Cosmos:

Dear Sir,—On page 903 of the August issue of the Dental Cosmos, Dr. J. H. Kennerly makes an erroneous statement when he says, "the St. Louis Dental Society—the oldest dental society in continuous existence," etc.

The St. Louis Dental Society was organized December 16, 1856. Eleven years prior to that date, viz, December 15, 1845, the Pennsylvania Association of Dental Surgeons was organized in Philadelphia, and has been in continuous operative existence ever since, thus making it not only *the oldest dental society in continuous existence,* but *the oldest dental society in the world.*

Burton Lee Thorpe.

St. Louis, August 4, 1906.

POLISHING GROUND SURFACES OF PORCELAIN TEETH.

To the Editor of the Dental Cosmos:

Dear Sir,—I have found that a cleansing preparation called Porcela recently placed upon the market is of considerable value to the dentist.

This powder is especially compounded for the purpose of cleaning and polishing bathtubs and other porcelain fixtures. Moistened with water and used with a felt wheel or the lathe it will impart an excellent polish to porcelain teeth which have been ground.

Edward C. Duryee.

Peekskill, N. Y.

PROCEEDINGS OF SOCIETIES.

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Thirty-seventh Annual Union Convention.

(Continued from page 859.)

WEDNESDAY—*Morning Session.*

THE first order of business was the reading of a paper by Dr. FRED. A. BALLACHEY, Buffalo, N. Y., on "Specialization in Dentistry," as follows:

SPECIALIZATION IN DENTISTRY.

Ever since the Pharaohs held sway on the banks of the Nile, and their wise men were versed in all the wisdom of the then known world, dentistry has been practiced in a manner more or less scientific. We are told by Herodotus that the Egyptian priesthood divided the practice of medicine into branches, and that one sect devoted itself to the study of the teeth. We have little to tell us of these ancient dentists but the silent witness of their work in the mouths of mummies, but this has shown that their knowledge was not the most meager nor their skill of the lowest order.

From Egypt the science was carried to Greece, and Homer tells us that Æsculapius, who lived 1250 B.C., used a narcotic for producing insensibility during the operation of tooth-drawing. Among the early Greeks, Hippocrates, who dates about 500 B.C., wrote about the teeth, together with other branches of medicine. Aristotle, Galen, and others of later date, also gave much attention to the subject. There is likewise evidence of dentistry having been practiced among the ancient Chinese, Arabians, Etrurians, and Phœnicians, and many of the specimens unearthed in these various countries bear testimony to the high class of skill employed upon them, and go to show that the men who practiced dentistry in ancient times were endowed with ability and genius to a surprising degree.

Early in the Christian era Galen taught that the canine teeth were supplied by a branch of the optic nerve, and should therefore be called "eye-teeth." Later Ætius apparently discovered the foramina at the roots of the teeth. Then came the middle ages, when so much that had been learned was lost under the fierce reign of superstition and tyranny which then prevailed. There was no incentive to discovery, and the advance of knowledge was almost at a standstill. The practice of dentistry, together with that of general surgery, was relegated to unscientific, unskilled, and probably often unscrupulous hands, and we know little more of it until about the beginning of the eighteenth century. Even then improvement was slow, though happily, as events proved, it was sure, and it paved the way for that organization and founding of the profession which began about 1839 with the opening of the Baltimore College of Dental Surgery by Chapin A. Harris. From that time to the present the young profession has grown, keeping pace with the marvelous advancement in other branches of science; and as it has grown, the need for specialization has become apparent.

Dentistry itself is often looked upon as a specialty of medicine, and ancient dentistry seems to have been practiced as such. But this is not true of modern dentistry in the same sense in which it is true of the other branches of medicine. It is, indeed, a very important branch of the curative art, closely allied with medicine, and it should be our endeavor to bring it still more into touch with that profession. The two should go hand in hand, because we cannot yet understand or realize the far-reaching effect which diseased conditions of the mouth may have upon the general system, nor the remote systemic causes which may lie at the root of many lesions of the mouth and teeth. Each branch needs the help of the other in the work of scientific investigation and research. But, notwithstanding this unity of interest, if we recall the unavailing efforts of Dr. Harris to establish a chair in dentistry in some of the medical schools prior to the opening of the Baltimore College of Dental Surgery before referred to, I think we must come to the conclusion that modern dentistry stands by itself as a profession, having its own root, stem, and branches, founded by its own practitioners, fostered and nurtured from the beginning by the fathers of dentistry.

The time has now come when it is a recognized fact that dentistry has its own specialties. We see references to it in the dental journals, and we see men devote their whole time to one or another of its branches, such as orthodontia, crown and bridge work, porcelain inlay, or oral surgery. More than that, an editorial in a leading dental journal recently made a plea for the "prosthodontist," or the man who would devote all his time to the prosthetic side of dentistry.

From the beginning there have been two well-defined branches in our science, viz, the operative and the prosthetic. In the early days the prosthetic branch included the making of artificial teeth, but now the manufacturer attends to this feature of the work. As a profession we have always discriminated against the prosthetic in favor of the operative, and the majority of dentists could almost rightly be called operative specialists.

The field of *operative dentistry* is so large and presents opportunities for such varied operations, that the radical specialist might divide and subdivide to his heart's content. From the simple operation of cleaning the teeth up to the complex and trying undertaking of reclaiming a mouth which for years has been the prey of pyorrhea alveolaris; and from the filling of the simplest cavity to the saving and building-up of badly decayed and putrescent roots, we have abundant opportunity for the exercise of patience, ingenuity, and skill, in the endeavor to solve the endless problems with which we may be confronted.

Besides care of the gums, the treatment of pyorrhea alveolaris, the curing of diseased roots, and the saving and restoration of the natural teeth, operative dentistry may be said to include the science of orthodontia and that of minor oral surgery.

Orthodontia is now a well-established specialty, having its own school and its national society. But necessarily in the country and small towns the general practitioner must often enter the field of the specialist in orthodontia as well as that of specialists in all other branches, and thereby splendid results are often achieved.

Of minor oral surgery little can be said here. Very few men practice it as a specialty of dentistry. There is, however, a fertile field for its practice as such in the treatment of antral disorders, encysted teeth, caries and necrosis of the maxillary bones, obstinate alveolar abscesses, and numerous other pathological conditions. If this subject were to be taught in a little more practical manner in the dental schools, the graduate in dentistry would feel better able to grapple with it and to perfect himself in it after graduation.

Of *prosthetic dentistry* there is much to say. As before stated, we become almost unconsciously operative specialists in the natural course of our practice. The busy practitioner well knows how little by little the prosthetic side is crowded out, and his time is almost wholly spent at the chair. If he be a country dentist he operates all day, and then sits up late working in the laboratory. Perhaps he employs an assistant. If he be a city dentist, and does not employ an assistant, his work is sent to the dental laboratory. If necessary, the dental laboratory can undertake the case from the bite-taking stage to the completion of the denture without ever seeing the patient.

Now, this is just the point we ought to note. We all realize that the prosthetic side of our practice is likely some day to be relegated to other hands. The operative department demands our attention, and after a hard day at the chair we are not in good condition to work at the laboratory bench. We know that this state of things is the natural trend in our practice, and we know that it must result greatly to the detriment of the prosthetic side of the work. There is a lack somewhere. Look at prosthetic dentistry today. In many offices it is not done at all, but is sent out to the dental laboratory; the dentist has not the time for such work. We look upon it as "cheap" and unimportant. We almost give our patients "ready-to-wear" dentures. This is not as it should be. We must try to raise prosthetic dentistry out of the slough into which it has fallen. Why is it not important to have a whole set of teeth well made and artistically finished, when we will give such care to a single crown? How can the dental laboratory man do justice to the case if he does not see the patient, and consequently knows nothing of his facial characteristics?

Years ago it was evident these two great branches of dentistry—the operative and the prosthetic—should be followed separately. In 1889 a paper was read by Dr. W. W. Allport advocating a complete divorcing of the two. Dr. Allport claimed that prosthetic dentistry should be followed as a high mechanical art, and not even taught in the schools with operative dentistry. It has, however, a higher calling than that of a high mechanical art. What we need today, and what the time is ripe for, is the prosthetic specialist—the thorough, up-to-date, professionally educated dentist giving particular attention to the construction of artificial substitutes. Let the busy operator refer his edentulous or partially edentulous patients to such a man, who will care for them from the beginning to the end of the work in an efficient and competent manner. The prosthetic specialist should possess the same degree of education as the general practitioner of dentistry, because he should be able to recognize and treat various diseased conditions of the gums, and also because he would thus be enabled to appreciate the value of the conservation of the natural teeth wherever practicable. He must, in short, work on a professional basis for the purpose of replacing the lost organs, rather than on a business basis with the view of manufacturing his raw material into plates, crowns, and bridges.

I said the time is ripe for the advent of the prosthetic specialist, and while we are not altogether without him today, still more are yet needed, as the field is a large one. This paper will not have failed in its purpose if it starts in any man the train of thought which will lead him to become a prosthetic specialist.

The age in which we live has been characterized as an age of specialization. We see it all around us. In all branches of science the tendency is to specialize. There is so much to be learned in every department that no average mind can perfect itself in all the details of one whole branch, hence a man must content himself with a general knowledge of the whole, and a thorough knowledge of his own particular sphere. As time goes on we shall probably see dentistry become more and more finely divided into specialties. The public is not unprepared for such a development. Hitherto we have not specialized enough, and not having been able to carry the whole load, a part of it—the prosthetic side—has been allowed to fall away, as I have endeavored to emphasize.

In conclusion, let me say that the field of the specialist belongs in the city, where great numbers of people are congregated. In the country and smaller towns the general practitioner, whether in medicine or dentistry, must often do the work of a specialist in more branches than one, and we are proud of him for his ability, and for the splendid and timely service he renders to suffering humanity. As he is blessed with a greater abundance of God's great out-of-doors, so he is less restricted in his professional life than his city brother; if the professional life of the latter runs in channels deep and narrow, that of the former may roll on broad, and smooth, and mighty.

In the cities, then, let us welcome and encourage dental specialization, that no branch of the profession may wither and be lost. Let all the branches grow and thrive together, each one well pruned and nourished, and the whole animated by that fine spirit of loyalty to the highest ideals which is a prime requisite in the uplifting and upbuilding of a profession.

Discussion.

Dr. W. W. Belcher, Rochester. I would divide the specialists into two kinds: specialists by inclination, and specialists by preference. I would define the specialist by inclination as the man who is not so intent on building up his practice and adding to his bank account as to take up all the branches of dentistry. The other—namely, the practitioner who by preference does inlay work, crown and bridge work, regulating, extracting—is the one who has been in practice for a number of years and has developed his practice unconsciously, perhaps, into a specialty. We all prefer to do those things that we can do well. At the present time there are more or less of us doing inlay work, but after a time there will only be a few doing it. We cannot be specialists in everything. A specialist is the man who does a few things well. I do not think that the specialist of the future must necessarily be confined to the city. Of course it is at present the logical place for him, but Emerson says, "If a man can write a better book, preach a better sermon, or make a better mouse-trap than his neighbor, though he build his house in the woods, the world will make a beaten path to his door." We have specialists not only in dentistry and the other professions, but also in manufacturing. The shoemaker calls himself a shoemaker when possibly the heel is the only part of the shoe that he makes. I spoke along this line several years ago when I read a paper on a subject similar to this, and mentioned the incident of the man who made pump-handles, and called himself a molder. This man called himself a molder until he entered another branch of the business, and discovered that he was simply a pump-handle maker. At the present time a man seldom learns the whole of any trade, but only a part of it. This was not true of the old-time workmen; they knew every line of work in their trade.

If we are to do justice to the patient, the teeth should be set up by ourselves and made ready for the man who does the remainder of the work.

I think that one of the things in which we are lacking is the post-graduate course. If a man is to become a proficient specialist he must take a postgraduate course occasionally. The medical practitioner who expects to keep up with his specialty will take a postgraduate course every ten years, and I think that is the course the dentist should pursue.

Dr. F. Messerschmitt, Rochester. I think that dentistry is a specialty of medicine pure and simple. If teeth were immune to decay, and needed nothing but treatment and occasionally an extraction, I think that work would have been carried on by the physician, and we would not have any dentists today. But the amount of mechanical and manipulative ability required to keep the teeth in a perfect condition is responsible for the present-day dentist.

In regard to specialists, it seems to me that it will be a long while before we have many specialists in dentistry. At the present time we have only fifteen out of thirty-five thousand dentists practicing orthodontia exclusively, which shows that that specialty is growing very slowly. When the young man graduates he generally makes an attempt to do all classes of work that come into his office. He is usually compelled to do so because of the lack of funds. As soon as he advances a little and becomes more prosperous he begins to feel as though he did not care to extract teeth, and refers the patients to someone who is willing to do this class of work exclusively. Later on, as he becomes still more prosperous, he will object to soiling his hands and doing rough laboratory work, and has his prosthetic work done in a mechanical laboratory. I would like to see the young man who would care to send his patients to a specialist to have any kind of filling inserted or bridge work supplied. Just as soon as he does that he might as well draw down his curtains and start on a long vacation. He usually sends away the work that is disagreeable to him; but does not send away the work that is a pleasure for him to do. Consequently I think it will be a long while before we have true specialists in dentistry. If a young man desires to become a specialist, I think it necessary that he should practice as a general practitioner for a number of years, so as to become acquainted and as familiar as possible with all the branches of dentistry, in order that he may be enabled to intelligently choose his specialty if he should wish to apply himself to some special branch of dentistry. As the young graduate has had no dental training in addition to that obtained during the three years spent at college—or perhaps he may have taken a postgraduate course in orthodontia for a few months after graduation—I think if he attempt to become a specialist at this time he will in most instances prove a failure. I do not think the beginner has had enough experience along any special line to make a success of it at the beginning of his professional career. The greatest field for the dental specialist in the future will be that of oral surgery, as there are very few dentists at the present time practicing that specialty.

In regard to orthodontia, I think the majority of dentists can handle the more simple cases if they apply themselves, but most of them do not feel as though they could devote the necessary time to it, and consequently usually neglect it or are glad to relegate to others this part of their work. The general practitioner in the small towns, though, is obliged to do this part of dentistry. I gave a clinic several weeks ago at Schenectady, showing the construction of appliances for the treatment of irregularities, and I was quite surprised to find the number of men in the smaller places who were successful in practicing orthodontia. There being no specialist near by to whom they could refer their patients, they were obliged to do it themselves, and consequently many of them have acquired considerable knowledge of the subject, and have been quite successful in this branch of their work.

Dr. W. J. TURNER, New York. Dentistry being a very complex science, calls into play abilities of great variety, so that there undoubtedly will arise in the future many opportunities for division into specialties. It seems to me, however, that this division into specialties will not occur until it is demonstrated to us that the general practitioner cannot obtain as good results in certain kinds of work as can the ones who devote their entire time to them. The entering wedge has been put in by the orthodontists, who have shown to us that they can do much better work than the general practitioner; at least they have shown us that they can do better work than the general practitioner has done. I think orthodontia, therefore, probably will be taken up as a specialty by many. The development of dental specialism will be retarded by the unwillingness of the patient to have any other than their regular dentist work upon their teeth. Long service begets confidence and attachment on the part of patients, and they dislike the idea of having anyone else look into their mouths. Under such circumstances that dentist has to do many things that probably someone else might do better. The people will gradually become educated, though, and will probably realize that it would be well to give some of the work to the specialist.

Dr. C. J. BARBER, Auburn. I think this paper is a very practical one. The ideas are good and well directed. We need more dentists. I mean more good dentists, men who attend dental meetings for the purpose of learning and in the endeavor to place themselves on as high a plane professionally as possible. I do not know how it is in the larger cities, but they must have specialists there who do the different kinds of work, one might say, to perfection, but in the smaller places we cannot have them. Every dentist should be able to perform all the operations pertaining to dentistry, inasmuch as in the course of practice he is compelled to employ cement, amalgam, gold, and all other kinds of filling materials; and to perform operations pertaining to the fields of crown and bridge work, porcelain, orthodontia, etc. He not only would do these things, but he desires to do them just as well as anyone else. His ambition is to do just as good work in all these departments as the specialists in the larger cities. He may have the knack and the ability to do all these things just as well, but the difficulty is the time it takes to keep abreast of the times in all the different branches. When a man graduates he is supposed to know how to do all the different kinds of fillings, prosthetic work, etc., without any trouble, but in the newer branches of porcelain work and orthodontia he needs time, and a lot of it, to study up the different details and to accomplish the good results he desires to obtain; and for this reason, in the smaller as well as in the larger cities, the time will come when specialties will be practiced more than they are now. We need more dentists measuring up to the high standard maintained by the better men of our profession.

Dr. G. W. PRINGLE, Niagara Falls. I think the man who does mechanical work is just as much of a specialist as the man who regulates teeth, and I think that perhaps in that department we have a greater need for a specialty than in any other line, because we have so few good prosthetists. We have in our town a man who is a thorough mechanic, who does not only plate work but crown and bridge work, and I think the reason why there are not more of such men is that the dentist is not willing to pay them adequate prices. This man does all of my plate work, but I do not think of having him set up teeth without seeing the patient. He first makes the wax plate and sets the teeth in wax; he then brings the wax plate to the office, and I always try them in the mouth and see that they fulfill the requirements of the case. He then does the remainder of the work. I am sure that the general practitioner cannot do this work in the same length of time and with as little suffering to the patient as the man who devotes himself exclusively to that special line of work.

Dr. A. MCALPIN, Bradford, Pa. The whole practice of dentistry probably covers as many or more subjects than any other department of the healing art, and the person who undertakes to become a specialist in the early stages of his career is likely to acquire narrow views regarding general practice. The specialist sees everything from the standpoint of his specialty, and makes all his operations conform to his special point of view. Perhaps it would be better for any young man entering into the practice of dentistry to first acquire a thorough knowledge of general practice, and then select those branches that seem best suited to him. We are all liable to get into ruts—there is no question about that, and if a man undertakes to follow one branch it seems to me that he should recognize the fact that there are other branches equally as important as his own, and constantly bear in mind the fact that people who have equal knowledge in other lines may possibly be able to give him some points; and not always consider his own specialty above everything else. I think the specialist who guards against that idea will excel in his own special line.

Dr. BALLACHEY (closing the discussion). I think this is a most interesting subject, especially at this time, when there is a pronounced tendency to subdivide the different branches into specialties. With most of the discussion I think I can agree most heartily. It is naturally hard for a specialist to be such from the beginning of his practice. One must grow, I think, from the practice of general dentistry to that of a specialty.

We naturally want to do all the work upon our patients ourselves, but if we know that the man around the corner can do better porcelain work than we can, we should send our patients to the man who can do it best; that is, if much depends upon the issue of the operation.

It is very true that specialists will not be recognized until they show that they can do better work than the general practitioner. When a demand is created for a specialty in the natural course of events, specialists will arise to fill it.

As I said in my paper, the public is prepared at present for the division of our profession into specialties. One of my patients asked me only the other day whether I did plate work or not, and I told her I did. Now, there was the idea in that patient's mind that some dentists did not do prosthetic work. And so I say the feeling is abroad that dentistry is being divided into specialties. Dr. Messerschmitt said that there are men in the smaller towns—where specialists are not available—doing regulating successfully along with their general practice. This is all the more to their credit, and we can but admire the splendid work that many general practitioners do where the services of a specialist cannot be procured. And it is in this way that men become ready to specialize when the opportunity offers.

Dr. Ballachey's paper was passed and the next order of business was a lecture on "Oil Colors as an Aid in Porcelain Work," by Dr. H. H. TOMPKINS, Utica, N. Y., as follows:

OIL COLORS AS AN AID IN PORCELAIN WORK.

From the announcement of my subject on the program, I conclude that I did not give the committee a correct idea of what I intend to talk about. I shall make no reference to mineral stains, or porcelain oil colors, but refer rather to oil paints, such as artists use in portrait and landscape painting. What I wish to suggest is the mixing of these paints as a means of educating the eye in the detection of colors. Few of us have had experience along this line, and now, with the introduction of porcelain as a filling material, we are suddenly called upon to produce the most delicate shading in order to match the natural teeth.

We have become accustomed to using the products of dental manufacturers in the line of crowns and facings, and the profession has become adept in selecting the facings which harmonize with the particular case in hand; but the making up, in our own office, of these various shades in porcelain from the basal colors is an entirely new proposition. If we undertake to learn this art by actually mixing and fusing porcelain, it will take a vast amount of time and experience to become proficient.

It occurred to me that a little preliminary work, or a kind of kindergarten course, in mixing oil colors would be a very instructive method to pursue in this connection. Being fortunate enough to have a friend who "swings the brush with grace," I consulted him, with very gratifying results. Just how an artist prepares his paints to produce the wonderful coloring and delicate shading which we see on the canvas was a mystery to me. My friend was good enough to come to the office and spend an afternoon with me, and show me how it was done.

I will be glad if I can give you a little insight into it, and then you can go home and work the problem out for yourselves, as I am working it out. My friend selected seven tubes of paint; they were raw umber, yellow ocher, Venetian red, rose madder, permanent blue, ivory black, and silver white. He placed a moderate quantity of each of these colors around the border of his palette; with the palette knife he took up a small quantity of a given color, carried this to the silver white, and at the same time caught a little larger quantity of that mix on his knife, when by dextrously working this on the palette, he drew the paint out so that the first that came from under the knife was of a very dark shade of the original color, which gradually was shaded out until at the bottom it was almost white, with only a trace of the original color showing. He did the same thing with each of the colors.

After this was done I gave my friend the S. S. White shade guide, and asked him to match every shade on the guide. This he did with remarkable rapidity.

There were many interesting things revealed as he worked, one being that the most beautiful shades of gray are produced by simply blending black and white. Of course yellow and blue make green; rose madder and white mixed together will match the most beautiful gum tints; brown, white, and blue will match many devitalized teeth; the right combinations of white, black, yellow, and brown will closely resemble the enamel. Shade No. 33 I have found very difficult to reproduce. I had always called this shade a dark blue, but to my surprise I find that it is a combination of black, yellow, and white. The blending of these colors has a fascinating interest, and it is marvelous how readily the eye will learn to detect shades and different combinations of colors after one has worked along this line for a little time.

To the advanced porcelain worker I have no suggestion to make, but I would urge the beginner not to be afraid to use strong basal colors and cover them over with white. The darker colors show through, and produce the translucency which is so desirable and an effect which is decidedly artistic. I am sure you will find a little work along this line not only interesting, but exceedingly beneficial in your everyday practice.

The subject was passed, and the next order of business as announced by the President was the reading of a paper by Eli H. Long, M.D., Buffalo, N. Y., on "The Relation of Circulatory Diseases to General Anesthesia."

[This paper was published in full at page 813 of the August issue of the Cosmos.]

Discussion.

J. M. Lee, M.D., Rochester. The ground that Dr. Long takes, it seems to me, is eminently proper. His topic was circulatory diseases, and while he spoke of the dangers of chloroform and nitrous oxid, he made no reference to the possible dangerous effects that may follow the inhalation of ether. This is of importance, as these effects are referable to the kidneys. Ether, even in healthy individuals, is very often found to cause nephritis, and to the minds of many medical men this after-effect counterbalances the good derived from ether, and makes it well-nigh as dangerous as chloroform.

The essayist told us that when we find a hardening of the radial or temporal arteries, arterio-sclerosis also very likely exists in the coronary arteries—a very proper conclusion to draw. He also stated in his paper—and quite truly—that these conditions were difficult to determine, or indeed quite impossible; so when we find that a patient suffers from a hardening of the radial or temporal vessels we should simply take it as an indication that we should be careful in the administration of anesthetics. We do not take it as a contra-indication, but simply as a hint that extreme caution should be displayed. At the same time, however, we must be very careful not to become timid with the use of anesthetics, as it may defeat the possibility of using caution; for the timid surgeon cannot be cautious, and every procedure he would employ to save the patient would very likely be frustrated. Again, that the patient takes the anesthetic badly at one time does not seem to be an indication that at another he will be the source of undue anxiety. It is a difficult matter to understand why a person will take an anesthetic so poorly one day and so satisfactorily another. This, perhaps, may be due to the manner in which the drug is administered, or it may be the result of some peculiar condition of the patient not operative at the time of the first administration.

Dr. J. Q. Byram, Indianapolis, Ind. I believe that the man who specializes in any line is better qualified to minister to his patients, whether it be in medicine or dentistry. This is being shown in our profession, in that in most cities there are specialists in extracting who administer anesthetics and do extracting exclusively, and the time is not far distant when in the cities the administration of anesthetics will be left in the hands of the specialists. It simply goes to show that to be properly qualified for this work, as well as in any other particular line, we must prepare ourselves; and where does the dentist get the training required to properly diagnose such conditions as mentioned in Dr. Long's paper? I am sure that I did not get it when I was in college. Most dental institutions are giving a series of lectures on physical diagnosis, but as Dr. Long has said, the course must necessarily be a theoretical one to a certain extent. It is impossible for the student in the short course he is made to pursue, to become sufficiently familiar with these conditions in order to enable him to diagnose them correctly, and for that reason I am very much in favor of having specialists in the dental profession for the administration of anesthetics. They will relieve us of all responsibility, and insure us that the work will be better done than most of us non-specialists in that branch are capable of doing it.

F. H. SAWERS, M.D., Rochester. The essayist spoke of the care one should exercise in the administration of anesthetics. There is one point that occurred to me in this connection, and that is in giving anesthetics to patients on whom the dentist is to operate—say for the extraction of teeth—where he is not able to operate in the prone position. I have felt some anxiety in giving the anesthetic in the upright position, even if the patient desires to have it thus administered. In reference to anesthetics, because a person has taken an anesthetic badly at one time is no argument that at a subsequent time he may not take it well. But great care should be taken in the administration at all times.

Dr. F. W. PROSEUS, Rochester. As a large proportion of members of the dental profession are called upon to administer anesthetics, we should endeavor to obtain the best knowledge available on the subject of anesthesia and anesthetics. In giving either chloroform or ether—especially chloroform—if the physician thinks the patient should be in the prone position he should insist upon it, regardless of the dentist's objections. It is likewise advisable that the dentist should insist that the medical man make a thorough examination if there be the least cause for suspicion regarding the condition of the patient, and that he prepare a hypodermic syringe with a stimulating solution ready for use. The dentist should refuse to operate unless the patient is well under the anesthetic. In my own experience, I can remember an unfavorable case which occurred in my office. The physician who administered the anesthetic had never before, during a practice covering a period of twenty-five years, had a case of collapse under chloroform. The patient was rather anemic and pale, and I told the physician that I did not just like the looks of the person, and thought it best for him to have a hypodermic prepared. "Well," he said, "if you will feel better about it, all right." The patient was made ready, and the chloroform administration begun. About the second stage of the anesthesia the patient collapsed and I was unable to detect the pulse or the slightest respiratory movements. In injecting the contents of the hypodermic syringe about half of it was lost, and it was a considerable time before the patient was revived. Now, there was the anesthetist's first case of collapse in twenty-five years, and I do not think that we can be too careful when we are operating in the dental office, where conditions as a rule are unfavorable. The patients come in often not properly clothed from the anesthetist's standpoint, frequently in great excitement, often after a long siege of pain, in a physical condition below par.

In my experience with dentists, I know that as a rule those who exclude all the air and are not very particular in examining the patients, but push the anesthetic right straight through, are the ones that have the least trouble. I know two or three men in Rochester who have told me that they push the anesthetic just as far as they can before operating, without ever experiencing any trouble.

The very cautious men with nitrous oxid are the ones who usually are the least successful, because they do not place the patient under profound anesthesia, and before the operation is concluded the patient having partially recovered or possibly having already experienced some shock, that reflex is carried to the centers of fear, and is, I think, oftentimes the cause of collapse with nitrous oxid. Undoubtedly, with chloroform and ether a great many of these cases of collapse are due to fear. My experience in the few cases of collapse I have seen under nitrous oxid in the last ten years is that all of them, except one, have been due to this cause, and I have come to the conclusion, as I said before, that the men who push the anesthetic right straight through and pay very little attention to examinations usually are the successful ones.

Dr. F. M. Rood, Rochester. I have a very limited knowledge of anesthetics in general surgery, but have had considerable experience with nitrous oxid, and I feel as Dr. Proseus does, that the man who pushes nitrous oxid to its full physiological effects obtains the best results. I have had some twenty-odd years of experience with the use of nitrous oxid, and have never had a case of collapse. I seldom ask the patient any questions regarding his physical condition. I simply pass judgment on the state of health myself from his general appearance, and outside of the loosening of the corset or neck-band, no further preparation is made. I usually keep up the administration until patients are thoroughly anesthetized.

Dr. E. R. Griswold, Dansville. This question of anesthesia in the dental profession is a serious one. In these days dentists are not giving general anesthetics as much as the old dentists did, for the reason that in anesthesia for the extraction of teeth nine-tenths of the patients request a local anesthetic. The administration of a general anesthetic is a dangerous operation in many cases, I admit, but I do not believe that the physician of the present day is any more qualified to give nitrous oxid than was the dentist of twenty years ago. It was the standard anesthetic at that time, and the dentist not only administered it then, but made the nitrous oxid himself. I wish the man were here in whose office I started, and who has extracted teeth under nitrous oxid for thirty years. During the years I was in his office he took each and every patient, one and all, put them in the chair, and without any careful examination administered the nitrous oxid and extracted every tooth in the mouth if necessary; and he never had any serious results.

As I say, the question of anesthetics is a very serious one with the dentist. He is frequently called upon to extract teeth painlessly, but our present local anesthetics are not to be depended upon, and if we had some safe and reliable local anesthetic—in which we are more concerned than general anesthetics—it would be a great boon to the patient and to the dentist as well.

Dr. C. F. Booth, Canandaigua. I would like to relate an incident which occurred in my town recently. A man, probably twenty-five years of age, rather pale in appearance, went to one of the dentists of our town for the extraction of a tooth. The patient was given ether by a physician; the anesthetic was carried to deep anesthesia, the tooth extracted, and the patient recovered sufficiently to converse, when suddenly he went into convulsions, and from the description of the event they had a nice time keeping him from jumping out of the window. The patient called at the same office for another operation of extraction a few days later, but the dentist, recognizing him, promptly declined to operate. The man then came to my office. I unhesitatingly placed him in the chair, gave him nitrous oxid and oxygen, and performed the operation, removing only a part of the tooth. After the effects of the anesthetic had, as I thought, passed off, the man rose up as though he were attempting to force himself through the back of the operating chair, and I had a hard time for about three minutes holding him down until he had fully recovered. He left the office, but came back the next day, as I naturally supposed he would, suffering severe pain. Not wishing to repeat the operation, I extirpated the nerve with cocain as well as I could and dismissed him. I heard nothing more from him until two or three days later, when he called at the office of another dentist. I had no idea that he would seek this dentist's services; I thought I had made him fairly comfortable, or I would have related my experience to the brother professional. This time a physician was called in, who put the man under an anesthetic in order to have the fragment of the tooth removed. After the operation the patient seemed to be recovering from the anesthetic nicely, when he again went into convulsions, and the dentist had all he could do to keep the man from throwing him out of the window.

I simply mention this experience in the hope that someone may offer an explanation for it.

Dr. Lee. I would like to ask if the man was an alcoholic.

Dr. Booth. I do not know.

Dr. G. W. Pringle, Niagara Falls. I would like to answer that question by saying that I had a similar experience with a man who was not an alcoholic. This was the case of a man of good habits, to whom a physician administered ether for the extraction of several teeth. After the teeth were extracted and the man was apparently all right, as we thought, he jumped up and gripped the physician, and had it not been for the interference of others he would have thrown him out of the window.

I would like to ask Dr. Long his opinion in regard to the position of the patient when giving nitrous oxid, whether or not it is necessary that he should be placed in the prone position?

Dr. Rood. I would like to ask Dr. Long to give his opinion of nitrous oxid in regard to its circulatory effects. Does it have any circulatory effects? I mean, in other words, does nitrous oxid produce any disease of the circulatory organs?

Dr. Long (closing the discussion). I wish to thank Dr. Lee for speaking of some of the dangers of ether. This is a point upon which there is a difference of opinion. Some statistics show ether to be unsafe as regards kidney conditions, while other figures show that chloroform is equally so. I think the report made several years ago by the British Medical Society's committee on anesthesia is of some significance in this connection. It includes about twenty-six thousand cases of anesthesia studied clinically. This report is significant, I say, because England is a country where chloroform is very largely in favor; but the report of this committee shows what all other figures show, that ether is far safer as a whole than chloroform. Their statement regarding the effects upon the lungs and the kidneys is that the bad effects of ether seem to be less profound than those of chloroform. It has also been shown that chloroform has an effect upon certain organs of the body that ether has not, in that it is capable of producing fatty degeneration.

In view of the remarks made to the effect that we must give an anesthetic whether or not, I would like to make the suggestion here that because the patient demands an anesthetic is no reason why it should be administered to him.

In regard to timidity in pushing an anesthetic, I think the ground taken by Dr. Lee is well taken; however, we must note individual exceptions. I think if we were to push the administration of chloroform boldly we might often regret it, for the reason that the dangers from chloroform are found to be more from concentration than quantity; that is, a certain quantity of chloroform taken in concentrated vapor during, say, ten minutes might cause death, while the same quantity diluted with air could be given during a longer time without much danger.

The question is asked with regard to the circulatory effects of nitrous oxid, and I can link that with a request made by one of your members that I say something about the prone position. The danger of the sitting position, particularly in chloroform anesthesia, is largely for circulatory reasons. Suppose we have a patient who, when in an erect posture, would require a heart power represented by 5 to keep up the circulation throughout the body, and in a prone position a heart power represented by 3. Now, let us assume that to that patient in a sitting position chloroform is administered, and that the heart power is depressed by the drug to say 3, or only sufficient to keep the heart going in a prone position; this power, as you can readily see, would be insufficient to keep the heart active in an upright position. When you speak of the danger of anesthetics, it seems to me that it is chiefly a question of how much a certain anesthetic will depress the heart. Therefore the danger would be greatest from chloroform, because it is the greatest heart depressant, and less from ether, and still less from nitrous oxid.

With regard to the case related where the patient created a disturbance after he had apparently recovered from the effects of the anesthetic, I remember the case of a lady to whom I administered ether, and for an hour afterward she was practically crazy. It seems that these cases are best explained by the fact that the control of the higher brain centers is reduced by the disturbing effects of the agent itself, thus causing violent disorder.

In prolonged operations the importance of using oxygen with the anesthetic is becoming more and more appreciated, as lessening the danger of auto-intoxication.

In regard to the responsibility for giving an anesthetic, or even deciding that an anesthetic shall be given, it seems to me that outside of the nitrous oxid—and we may probably class ethyl chlorid with nitrous oxid—it is hardly worth while for the dentist to take the responsibility of deciding whether an anesthetic shall be given and what agent shall be employed. This is really a matter for the family physician to decide.

With regard to the administration of nitrous oxid without any discrimination as to the condition of the patient, I believe that the time has passed when we can subscribe to that kind of a program. Nitrous oxid is admittedly the safest of all anesthetic agents, but there is one class of cases where I should very much fear to give it; that is where there is serious valvular disease which does not show in the patient's appearance, but because of which the heart has all that it can do to keep the circulation fairly active under ordinary conditions. In these cases the administration of nitrous oxid in the usual way will bring in the element of asphyxia, disturb the circulatory conditions, and disable the heart.

(To be continued.)

CONNECTICUT STATE DENTAL ASSOCIATION.

Annual Convention, Bridgeport, Conn., April 18 and 19, 1906.

TUESDAY—*Morning Session.*

THE forty-second annual convention of the Connecticut State Dental Association was called to order on Tuesday morning April 18, 1906, at 10.30 o'clock, in the convention hall of the Y. M. C. A., Bridgeport, Conn., by the president, Dr. E. B. Griffith of Bridgeport.

The first order of business was the reading of the minutes of the last meeting.

Dr. G. O. MCLEAN moved that the reading of the minutes of the previous annual meeting be dispensed with, inasmuch as they had been published in full in the Transactions, of which a copy had been sent to each member of the society.

The motion was carried.

Dr. JAS. MCMANUS, in behalf of the members of the society, then presented to the president a handsome ebony gavel.

The President accepted it, and thanked the society for its kind remembrance of him as its presiding officer.

The next order of business was the reading of the report of the Treasurer.

Dr. HINDSLEY then reported in behalf of the Board of Censors that the following applications for membership had been acted upon favorably by the Board: Frederick Arthur Scott, Woodbury; Chester Milton Scripture, Bridgeport; Robert Hallock Wright Strang, Bridgeport; Charles Rushing Uhle, Bridgeport; Arthur M. Hunter, Bridgeport; Wm. T. Casey, Bridgeport; Geo. Walker Cairoli, Bridgeport; John S. Cairoli, Bridgeport; Walter David Bray, Hartford; William Bradley Wheeler, Westport; William S. Gibb, New Haven; Edward L. Richards, New Haven; George Christopher Fahy, New Haven; Frank P. McEnerney, New Haven; William B. Brewster, Waterbury; E. W. Moyer, Waterbury; Emil R. Patzold, Waterbury; Henry H. Gorton, Naugatuck; Fritz Julius Swanson, Ansonia; Benjamin Hoyt Keeler, New Canaan; Willey T. Smith, Winsted; James H. Weeks, Jr., Stonington; William Wheeler Leonard, Jewett City; George S. B. Leonard, Mystic; Charles Pratt Blinn, New Milford; David Banks Hawley, Long Hill; Frank B. Hoyt, East Norwalk; Albert H. Spicer, Jr., Westerly, R. I.

Motion was made and carried that the entire list of applications be acted upon at one time, and that the secretary be empowered to cast the vote of the society for the entire list.

The motion was carried, and the entire list of applicants was declared elected to membership.

Dr. F. T. MURLLESS, Jr., then presented the following resolution:

RESOLVED, That the following become Article X of the by-laws of the Connecticut State Dental Association, that the present Article X be made Article XI, and succeeding articles be renumbered to correspond:

"No dentist or physician who is not a member in good standing in his own local or state society shall present either a paper or clinic before this association, or take active part in the proceedings."

Dr. JAMES MCMANUS moved the adoption of the resolution, which was, according to the by-laws, laid over until the next regular meeting before being passed finally by the society.

Dr. A. W. Crosby, New London, vice-president, took the chair and Dr. E. B. GRIFFITH, president, read his annual address.

The next order of business being the nomination of officers, Dr. Strang moved that a nominating committee be appointed by the president to present nominations to the society at a later session.

The motion was carried, and Dr. Griffith appointed the three previous presidents of the society as the nominating committee: Drs. Edward Eberle, G. O. McLean, and D. W. Johnston.

Dr. PROVOST moved that a committee be appointed to voice the appreciation of the Connecticut State Dental Association to Senator Bulkeley for his efforts in behalf of the army and navy bills.

Dr. JAMES MCMANUS offered as an amendment that the secretary be instructed to express the thanks of the association to Senator Bulkeley.

The amendment was accepted and the motion was carried.

There being no other business at the present time, the society adjourned until the afternoon session.

TUESDAY—*Afternoon Session.*

The second session was called to order by the president, Dr. Griffith, Tuesday afternoon at 4.30 o'clock.

The first order of business was a lecture by Dr. E. C. KIRK, Philadelphia, Pa., on "Chemical Principles Involved in Tooth-Discoloration," as follows:

CHEMICAL PRINCIPLES INVOLVED IN TOOTH-DISCOLORATION.

Attention was called by the lecturer to the well-known fact—which had been observed as early as 1839 by Dr. Chapin A. Harris, and frequently since then—

that the teeth of animals as well as of human beings who had been killed by strangulation—as in hanging—or by blows upon the head or sometimes from gunshot wounds in the head, became of a pinkish tint shortly after the traumatism had been inflicted. This phenomenon in the early days was believed to have established the theory that there was a vascular circulation in the dentin, and further that the dentin was a vital tissue. Our later histological studies of dentin structure, and also of the histological and chemical character of the blood, has given us the basis of a more rational explanation of the phenomenon of pink discoloration of the teeth in the cases referred to. It is now known that the pink staining of the tooth is brought about by a rupture of the stroma of the red blood-disks liberating their contained hemoglobin, which dissolves in the plasma, forming a solution of hemoglobin which readily penetrates the dentinal tubuli, the lumen of which is of insufficient diameter to admit the unbroken red corpuscle. This pink discoloration resulting from the infiltration of hemoglobin solution represents the first stage of tooth-discoloration. The same conditions may also be brought about by the injudicious application of arsenous oxid for the purpose of pulp-devitalization, especially in cases of minute pulp-exposure, the arsenic acting as a violent irritant, producing sudden congestion with rupture of the corpuscular stroma and liberation of its contained hemoglobin. Certain other agents, as for example, nitro-glycerin, when employed in connection with cocain solutions, may bring about the same liberation of hemoglobin, producing what is commonly known as hemolysis, with consequent staining of the dentin, when such solutions are applied topically to the exposed pulp preparatory to its eventual extirpation.

The pink stain rapidly undergoes alterations, later on assuming a brownish tint, due to the breaking down of the highly complex molecule of hemoglobin into a reduction product known as hematin. Illustration of the changes referred to was made by adding a small quantity of sulfuric ether to several ounces of defibrinated bullock's blood, the ether causing the rupture of the corpuscular stroma and the liberation of the hemoglobin and its solution in the plasma, producing that change known as laking of the blood, as described by physiologists. The difference in the appearance of the laked blood and the whole blood was shown by samples of each placed together for purposes of comparison. The reduction of the hemoglobin to hematin was shown by the action of dilute nitric acid upon the film of laked blood spread upon blotting paper. The acidified area was instantly changed in color from the characteristic red to brown.

At this stage the effect of hydrogen dioxid solution as a bleaching agent upon the hemoglobin and hematin surfaces respectively was shown by brushing hydrogen dioxid solution across both, the result being that the hemoglobin stain was bleached quite rapidly, whereas the hematin stain showed no response to the action of the bleaching agent. From this it was deduced that the tooth could be more readily bleached by hydrogen dioxid in the pink stage of discoloration; and second, that care should be exercised to use an alkaline or neutral solution of hydrogen dioxid in the bleaching process, as any free acid would have the effect of reducing the hemoglobin to hematin, and thus increasing the resistance of the stain to the action of the bleaching agent.

The relative effect of sodium dioxid, of chlorin, and of hydrogen dioxid respectively were shown in the capacity for bleaching the hematin stain, with the result that the most rapid bleaching effect was produced by chlorin, the next by sodium dioxid, and the slowest by hydrogen dioxid.

The lecturer called attention to the principle that the bleaching process was to be regarded merely as a means for so altering the composition of the color molecule that the resulting compounds should be colorless, and to the further fact that bleaching by no means removes from the texture of the tooth all of the elements concerned in the production of the original stain; it merely alters their chemical relationship, hence definite steps should be taken to prevent a future return of the discoloration, either by removing in soluble form all the residual compounds produced by the bleaching process, or else by so hermetically sealing them into the tubuli with an impermeable material that oxygen or moisture cannot come in contact with them and bring about future alterations which might result in the formation of color-producing compounds.

Attention was directed to the fact that iron is a characteristic component of hemoglobin, and that notwithstanding the fact that the dioxids will bleach hemoglobin and its derivatives, producing colorless compounds with the iron element, the iron still exists in a colorless combination in the bleached stain. This fact was demonstrated by applying to a bleached surface the usual reagents for the chemical detection of iron, with the result that its presence in the bleached tissue was proved by the characteristic iron reaction obtained. As a means of overcoming the tendency toward a re-discoloration of the bleached tooth two methods were recommended: First, bleaching by chlorin, whereby the iron is converted into soluble chlorid, when it can be washed out of the tooth-structure by copious irrigations of hot distilled water after the bleaching process has been applied; second, where the tooth has been bleached by any of the dioxid methods, thorough desiccation of the tooth-structure by hot air, and filling the tubular structure with paraffin solution or solution of copal in ether.

The lecturer strongly advocated a more thoughtful consideration of the tooth-bleaching operation as a conservative procedure in dentistry, and deplored the too frequent solution of the discolored-tooth problem by the mechanical substitution of an artificial crown for the discolored tooth, which procedure, in view of the success to be obtained by the intelligent application of bleaching methods, could only be regarded as a confession of incompetency upon the part of those who were willing to sacrifice the useful natural crown and to replace it by an artificial substitute simply because of lack of familiarity with the bleaching process.

Discussion.

Dr. M. L. RHEIN, New York, N. Y. Mr. President, ladies and gentlemen: I believe I echo the sentiment of everyone who has listened to Professor Kirk's remarks when I say that we all appreciate the value and delicacy of the experiments which he has just made.

The time I think has long since passed when the cutting off of crowns for this purpose can be considered a permissible procedure. I might add to the sentiments to which we have just listened in regard to the objection to this procedure, by referring to another phase of the question of crowning a root, whether it be with a shell gold crown in the case of posterior teeth or with a porcelain crown in the front ones. This operation means decidedly more than the mere loss of the exposed portion of the tooth-structure necessary in order to insert such a crown properly.

It is necessary for me to call your attention to the amount of work performed upon the root of the tooth itself, around the outer periphery of the peridental tissues, an operation that weakens the root—the real mainstay of every tooth. For my part, I believe that the most valuable aid that the inlay—whether porcelain or gold—has given to dentistry in the last few years has been in its tendency to do away with so much of this radical crowning of teeth, because it enables us to save more of the vital part of the tooth, namely, the root itself, which, as I have already stated, is the mainstay of the tooth whether it contains a pulp or not. The important thing to achieve in the ordinary discolored tooth is that it should be bleached and not cut off and crowned, because the length of life of the root itself is always lessened when we have to resort to this radical procedure.

The remarks that we have listened to are certainly in accord with my experience in regard to the ability to bleach teeth thoroughly at the very moment of the accident, and the great difficulty encountered a short time afterward—when the hematin discoloration has taken place —in accomplishing the same results; and then again, the ease with which the tooth is bleached after it has been discolored for a number of years. I was reminded in a humorous way, in listening to Dr. Kirk, of a candidate who, being examined before a dental licensing board, when asked how he would bleach a discolored tooth, said he would first send the patient home for five years and afterward bleach the tooth in the ordinary manner. I want to say in regard to this hematin stain—and I very likely echo the sentiment of many others—that it has given me considerable difficulty. Now, what Dr. Kirk has told us resolves itself into one main point, namely, that a certain amount of the substance of the blood becomes impregnated in the dentin of the tooth itself, and that in order to obtain permanent bleaching results we must remove that substance entirely or we will not have accomplished our object.

My efforts in this direction have consisted in removing as much of this iron compound as possible, by cutting very freely into the tooth. I recognize the objection that is certain to be brought against this free cutting in the interior of the pulp-chamber, and perhaps the root-canal, and the danger—for there is a certain amount of danger—of a subsequent fracture of the tooth. Of course in following this method the operator has to exercise due caution as to how much of that excavating he can safely do, in view of the method of restoration that he will pursue. I have had very few disappointments to call my attention to the danger resulting from this practice; I am only putting this side of the picture forward because I recognize that such is the criticism which will be made against the method. The point I have in view is the free removal of this iron compound, and the cutting far enough into the structure to remove as much of it as possible. I have never been able to clear up a tooth discolored with hematin stain in any other way than by this very free cutting, and I have bleached a great many in that way; very successfully, too.

I recall the case of a young man who came to me about two years ago. While bicycling in the Adirondacks, he fell accidentally, and split off the two corners of the central incisors. It was about four weeks after the accident before I saw him, and he very graphically told me that the teeth had been a beautiful pink the first few weeks after the accident, and that afterward they had turned brown. I said, "Yes, if I could only have seen the teeth immediately after the accident we would never have had much difficulty in bleaching them." Well, I had to cut freely into these teeth before I was able to obtain the results that I wanted. I finally succeeded in reaching the limit of the zone of the iron stain. They were restored with porcelain corners, and since then, although I have watched them very closely, I have failed to notice the slightest return of the discoloration. I recognize the danger, but it is one that depends upon the ability of the individual operator to avoid.

Those of you who heard my paper a year ago on the treatment of root-canals will remember how I emphasized the point that the method which I have demonstrated is of importance in relation to the bleaching of teeth. It has great value, especially in those cases where the discoloration has reached the stage where the dark stain is pronounced. The sodium and potassium compound, by virtue of its power to combine with any organic material in whatever stage it may be, whether living or dead, has the power of decomposing every particle of organic tissue with which it comes in contact; and during the thirteen years that I have used this preparation constantly I have failed to hear of any case of discoloration of the tooth following its use, which is due entirely to the power of the kalium-natrium preparation to destroy every particle of organic tissue. This is the secret of the method. The discolored material, whether it be hematin, or whatever it be, is deposited in the organic tissue. It cannot penetrate into the inorganic tissue, because the latter is too dense for the pigment to penetrate it to any considerable distance. This preparation permeates whatever organic matter it may encounter, and the secret of success with this method lies in the amount of sodium and potassium the operator is willing to use; or, in other words, the amount of time one is willing to devote to the introduction of the sodium and potassium in order to give the compound sufficient time for it to unite with the organic tissue, which extends out into the canaliculi of the root itself.

Dr. C. W. STRANG, Bridgeport, Conn. I have occasionally had cases in which were present exactly those conditions which have been referred to by Professor Kirk. Only about a year and a half ago, one of my patients—a young man perhaps sixteen years of age, who was away from home at school in a city on the Hudson river—unfortunately was struck by a baseball on the central incisors. When he came to me the right central was of a beautiful cranberry color, the accident having occurred about ten days before. There had been but little discomfort, except that both of the centrals were tender, but when the patient saw that the right central was beginning to show signs of discoloration he became alarmed, and came to Bridgeport for treatment. I knew of course the condition of the case, and I know better now what course I would pursue in the treatment of a similar case. I opened the tooth on the lingual surface quite freely, and removed the pulp. It was entirely devitalized, of a very dark red color, and came out in one mass, the operation causing little or no pain to the patient. My first application was of hydrogen dioxid, but it did not remove the discoloration satisfactorily, though it did improve the appearance of the tooth. I kept up the treatment for a week or so and dismissed the case temporarily, after closing the apex of the root. I had great difficulty in removing the discoloration to an extent that was satisfactory to me. I used hydrogen dioxid, calcium hypochlorite, ether, chloroform, alcohol, and one thing and another, and kept the treatment up for several days, closing the tooth again I saw the case two or three months afterward and gave it another treatment similar to the first, and while there was some improvement after the second treatment, the tooth remained in a condition that might improve, I think, as time goes on.

I remember the very first case that I ever saw of pinkish discoloration, many years ago—I think about thirty. It was that of a right central incisor, which had been filled a number of months previous to the case coming to my hands, and that tooth is in place today. I have during the last two or three years urged upon the patient the advisability of removing the crown and having an artificial porcelain crown adjusted in its stead, and it was only recently I obtained the consent of the patient to have the natural crown removed. But at the time of the appointment the patient had an attack of influenza, the operation was postponed, and the natural crown is still intact, but quite dark now.

Dr. J. E. NYMAN, Chicago. Ill. I could not help thinking while listening to Dr. Rhein's discussion that it would be a dangerous procedure to cut away the root, as he says he does.

Dr. RHEIN. I did not say cut away the root, but the crown.

Dr. NYMAN. I misunderstood Dr. Rhein's statement. But still in that case it seems to me there would be considerable liability to fracture, even of the root.

I apprehend that in many cases where we find the discoloration in the incisal edge of a central incisor worn down to where the dentin is exposed, we have some difficulty in imparting the proper color to that tooth. Those are the cases where I have met with unfortunate results. Like everyone else, I have had cases where I have bleached teeth most successfully, and on the other hand I have had cases in which the results were such that I thought I knew very little about it, and demonstrated to the patient that I knew even less. Now Dr. Kirk in the last few years has succeeded in explaining to me why I was successful in some cases and decidedly unsuccessful in others. I think our only hope of success in bleaching teeth is in making a definite diagnosis of the conditions, and differentiating the cases which present themselves, not attempting to classify all these conditions under one head. Dr. Kirk's effort in the last few years has been to classify the pathology of these different conditions, in order to permit us to make a differential diagnosis of each case, and to follow the proper treatment with successful results.

A MEMBER. Dr. Kirk spoke of concentrated solutions of hydrogen dioxid. I would like to know whether he uses the twenty-five per cent. solution or whether he uses the concentrated solution in any other way.

Dr. KIRK. I have used both methods, the ethereal solution and the aqueous solution. In a desiccated tooth the ethereal solution is in my judgment the one to be used. On the other hand, when attempting to bleach a tooth with the natural moisture present, I have resorted to the aqueous solution, because an aqueous solution of hydrogen dioxid is more agreeable to moisture than an ethereal one would be. It depends on whether the tooth is moist or dry. There is but little difference, although the advantages are in favor of the ethereal solution in the desiccated tooth and the aqueous in teeth where the natural moisture is present.

Dr. C. C. PRENTISS, Hartford. Dr. Kirk speaks of the hematin discoloration and hemoglobin discoloration. There is a third discoloration which gives us considerable trouble.

Dr. KIRK. There are half a dozen others.

Dr. PRENTISS. There is a discoloration which takes place on the external surface of the teeth, and I should like to hear Dr. Kirk say something in reference to it. It first starts on the tooth-structure as a brownish discoloration which rapidly spreads all over the tooth. I have named it for want of a better name *saprogenous* disintegration, and I have never been able to do anything in the way of removing it, except by cutting away the tooth-structure thus affected. I would like to hear what Dr. Kirk has to say about those cases.

Dr. KIRK. Of course the type of discoloration to which Dr. Prentiss has referred is very well known to all who have frequently observed cases of tooth-discoloration. Just what it is I do not know. I suspect, however, that what is implied in Dr. Prentiss' terminology is along the correct line of reasoning; that is, that the decomposition of some organic matter on the tooth is the cause of the trouble. Whether it is absorbed from the outside, or whether it is decomposed matter in the tooth, I do not know. It is probable that it is due to some organic decomposition. Of course there is a possibility of absorbing all kinds of materials through the dentin, from foods, etc., taken into the mouth. We are all familiar with the brown stain which occurs in the mouth of the smoker. Let me say in regard to smoker's stain, that tobacco will stain the dentin, but we have seen these stains in the mouths of individuals who do not smoke or use tobacco, women for instance. I saw such stains, in Boston not long ago, in the mouth of a lady who I am sure does not smoke. The labial surfaces of the incisors were denuded of enamel, and the teeth were badly stained. Now, the most hopeful thing that has been done with these cases is that suggested by Dr. Head of Philadelphia. Dr. Head found that by taking a strong hydrogen dioxid solution, put on thin tissue paper and applied to the tooth, and then with a hot instrument steaming or frying the hydrogen dioxid into the tooth, he was able to reach these stains. As a rule, they do not penetrate very deeply into the tooth-structure, but I have seen some cases where it seemed to follow right down the line of distribution of the dentin fibers almost to the pulp-chamber. In the class of cases referred to by Dr. Nyman, our only recourse is to bleach the case by Dr. Head's method of steaming the application through the thin desiccated structure, and then attempt to plug up the open ends of the tubuli and seal the application into the tubuli at this temperature. That is the most hopeful suggestion I have to offer. I do not consider this a final settlement of the problem. Dr. Head has bleached many cases in this way, and I have bleached some myself, but these brown stains upon the external surfaces of the teeth are entirely a different proposition from the one which we are studying here.

I may say in regard to this subject, that the question of discoloration of the teeth and its treatment occupied my attention during several lectures to my classes, and my talk today has necessarily been only superficial. This is a profound problem, and one that requires considerable study, and I could do no more than to call your attention to the main principles, in the hope of awakening further interest in the subject.

Dr. A. J. FLANAGAN, Springfield, Mass. Dr. Kirk spoke only in a very limited way of the discoloration caused by metals. I believe there is no discoloration from pure platinum. I would like to know if he has had any experience with discoloration from iridio-platinum?

Dr. KIRK. I don't think it is possible. It is not, on any theoretical ground, because iridium and platinum are equally refractory toward any chemical agent except the halogen group; outside of the halogen group there is not a single agent that I know of that will act upon platinum or iridium.

Dr. FLANAGAN. The reason I spoke of that is because it seems to me, from the scientific and logical demonstration here this afternoon, that we as dentists are perhaps not protecting the best interests of our patients when we use base metals in pins of teeth or crowns. It is a well-known fact that we frequently have to build out the corner of a tooth, and that in doing so we often have to use a metal pin in order to secure proper anchorage for the filling. It is also a well-known fact that many times the cement which we put into the anterior teeth is mixed with a steel instrument. Now, as Professor Kirk says, discoloration may result from even steel instruments used in mixing cements. If this is a possibility, what may we expect from base-metal pins used in crowns, or for the attachment of gold fillings in building up the corners of teeth? I think that we have a duty to perform—especially at the present time, when the products of so many manufacturers are supplied with base-metal pins. At the present time the pins of a vast majority of the teeth and crowns—and I speak from information gained from men who are engaged in the dental manufacturing business—are made of base metal. Such pins are very liable to cause discoloration, whereas if we used pins of greater cost, and made of platinum or iridio-platinum, this liability to discoloration would not exist. It appears to me that our duty to our patients demands that we use metallic pins that will not cause discoloration, be the cost what it may, especially in crowns for the anterior teeth. We many times pride ourselves on the integrity and worth of our profession, but before we can justify ourselves in the use of base metals in the mouth, science must prove that base metals are the best. Let us reason honestly: Think you that base metals are used because of their superiority over platinum or iridio-platinum? Thinking men in our calling usually reason that base metals are used simply because of their cheapness—and yet we pride ourselves on our high professional standing!

Dr. NYMAN. I realize that I may have done Dr. Rhein an injustice. He is quite right in suggesting that we remove surgically all of this discolored material which is not essential to the tooth, and I know Dr. Rhein would not do this in an injudicious manner. There is no question that this is good advice, as it leaves less of the material which is discolored, and affords less liability to rediscoloration, and furthermore we can work to better advantage from freer access to the tooth. Dr. Rhein's advice is quite timely, only it has been my practice to cut out this material before I bleach the tooth at all. I cannot see the logic of bleaching it first and cutting it out afterward.

Dr. RHEIN. If I allowed anyone to understand that I did the bleaching before the cutting, it was unintentional. In the first place, I want to amplify one point. The use of the sodium and potassium for the removal of the organic tissue I continue uninterruptedly until I feel that I have removed every particle, and I have before that used the bur freely. The cutting is done before I resort to chemical means to continue the work of removal of the organic tissue. I first do a very liberal amount of cutting. I speak of this in an apologetic tone because I believe I cut four or five times more freely than is done in most teeth by other operators. I certainly did not intend to convey the idea that no cutting was done before I used the sodium and potassium compound. I do not use any hydrogen dioxid preparations until I have finished with the sodium and potassium. In the ordinary course of work I continue with the sodium and potassium until I have finished with that part of the operation, because my experience has led me to believe that it is almost impossible to get the sodium and potassium preparation to work as efficiently in its destruction of the organic matter after I do the bleaching. The bleaching process is the ultimate operation, and I carry the sodium and potassium treatment to such an extreme that when I am removing the pulp from what I call a gouty tooth—one that is filled with pulp-nodules to a large extent, and it is frequently necessary for me to see a tooth of that kind two or three times—I leave the sodium and potassium inside the canals until the next sitting. I never think of using any hydrogen dioxid on the tooth until after I have used the sodium and potassium preparation for the last time. I trust that I have made myself clear on this point.

Dr. JAMES McMANUS, Hartford, Conn. It may seem singular, but it is a fact that I can recall only about half a dozen cases that I have treated. I will admit that I treated these empirically, without knowing very much about them, by cutting away the structure—not nearly so freely as Dr. Rhein speaks of—and by using alcohol and Labarraque's solution, packing the cavity with precipitated chalk, sealing this in the cavity, and leaving it for a few days, then removing it; and in a few cases I have had a certain amount of success.

Dr. G. L. HURD, Lakeville, Conn. We are told that there is a possibility of the discoloration returning. There was nothing intimated as to the treatment in case this iron discoloration did return, and I would like to ask Dr. Kirk what we are to do in case this should occur.

Dr. KIRK. It is a fundamental principle in the consideration of the methods by which we treat these cases, that when we are dealing with hemoglobin stains or any stains that are caused by derivatives of hemoglobin, or any organic material, we may properly use the dioxid methods. When we have to deal with metallic stain, which it practically amounts to when we reach the last stage of the discoloration, we must classify these stains with the inorganic or metallic stains. Now, as a general principle, I think our sheet-anchor in the treatment of the metallic stains is in some of the methods based upon chlorin. It is the same with those stains mentioned by Dr. Flanagan—and, by the way, I have been waiting for some one to sound a note of alarm at the use of base metals in the teeth. There is absolutely no excuse for it whatever, to my mind. As I say, our sheet-anchor in this class of stains is in the use of some of the methods based upon chlorin, because the chlorids of these metals are soluble, and can be washed out. They cannot be bleached by any of the dioxid methods, but can be by chlorin.

I am very glad that Dr. Flanagan mentioned the use of the base metals in teeth, as I want to say that I think such a practice is inexcusable. We should give our patients the best possible, and charge them accordingly for it. Don't save twenty-five cents on a pin and ruin your reputation just because the base-metal pin costs less. That is not good ethics, and after a while we will have a lot of this work to clean up all over dentistry.

Dr. Kirk's paper was then passed.

Dr. JAMES McMANUS presented to the society a photograph album which had been given by the society to Dr. Asa Hill at its first meeting in 1864. The album was returned to the society by Dr. Hill's daughter, Mrs. Iva Cole of Norwalk, Conn.

Dr. STRANG moved that the secretary be instructed to communicate with the daughter of Dr. Hill, expressing the thanks of the association for the gift of the photograph album.

The motion was carried.

Dr. E. S. GAYLORD moved that the album be presented by the society to Dr. McManus, as he had been instrumental in recovering it.

Upon objection to this plan by Dr. McManus, Dr. A. C. Fones moved that Dr. McManus be made the custodian of the album.

The motion was carried

Dr. MCMANUS also called attention to a movement to erect a memorial to Dr. Horace H. Hayden at the place of his birth near Windsor, the soliciting of contributions being in the hands of Dr. G. O. McLean.

Dr. C. W. STRANG moved that a subscription to the contribution for the purpose of erecting a memorial to mark the birthplace of Dr. Hayden be made by the society, and that the amount of the contribution be decided upon by the society.

The motion was carried.

Dr. CHARLES MCMANUS moved that the amount of the contribution be twenty-five dollars.

Dr. CROSBY amended this to the effect that the amount be not less than twenty-five dollars nor more than fifty dollars, according to the condition of the treasury after the meeting.

The amendment was accepted, and the motion was carried.

Motion was then made and carried to adjourn until the evening session.

(To be continued.)

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PHILADELPHIA, SEPTEMBER 1906.

EDITORIAL DEPARTMENT.

THE GENERAL PATHOLOGICAL SIGNIFICANCE OF PERICEMENTAL INFLAMMATIONS.

THE significance of sound teeth as a factor in the maintenance of health, and, *vice versa*, that of diseased teeth in producing and aggravating pathological processes throughout the body, is a matter which, while properly understood and interpreted by the studious and thinking element of the dental profession, is by no means receiving the share of attention from the medical profession and the laity which we believe it deserves. The teeth and their adnexa being an integral part of the human mechanism, occupy physiologically a position, with reference to the preservation and disturbance of the health status, relatively as important as that of any organ of the human economy. They are organs without whose helpful co-operation the functions of the digestive apparatus cannot be properly carried out, and inasmuch as gastro-intestinal disturbances are at the bottom of innumerable cases of malnutrition and auto-intoxication, the importance of the teeth as units of indispensable value in this connection becomes at once manifest.

Several distinguished investigators have of recent years repeatedly called attention to the rôle which diseased teeth play in the causation of systemic diseases and in eventually ruining in health and permanently incapacitating individuals who, had they received at the proper time logically planned treatment. would have remained uninterruptedly healthy and useful citizens. It is, however, necessary to state in this connection that nearly all the efforts on the part of the dentally educated practitioner in calling the attention of the public to a proper recognition of the significance of sound dental organs have been made in the shape of appeals directed toward the eradication of caries, while little or no effort, individual or concerted, has been expended in educating the unenlightened public to the far more dangerous consequences of diseased alveoli of teeth. Without any intention to underestimate the caries phase of this question, we feel, however, that caries for obvious reasons is not responsible for the causation of as many systemic ills as are traceable to alveoli the seat of inflammatory changes. Caries is *per se* an admonisher of danger and discomfort as soon as it has progressed to the extent of involving the sensitive structures of the teeth; and, as few are willing to endure indefinitely the tortures of a severe toothache, sooner or later the evil is halted. Inflammatory diseases of the alveoli and pericemental membrane, on the other hand, progress slowly, yet actively, and often persist for years without being perceived by the sufferer. During such periods the exudates of the inflammatory action in the form of pus, semi-disorganized cells, or gangrenous tissue, have been contaminating the food and constantly gaining access to the deeper structures of the body, wherein they set up infectious changes which in some instances have been known to end fatally. The involuntary ingestion of the pyogenic products of pericemental inflammation is, in addition to some well-defined abnormal changes, responsible for the onset of a series of general systemic manifestations which may be regarded in the light of a pneumococcus toxemia, for sufficient clinical evidence has already been gathered to prove that at least in some typical cases of pericemental inflammation the diplococcus pneumoniæ is one of the most conspicuous components of the mixed invasion. The manifestations of this pneumococcus toxemia in the shape of a decrease of vital activity and resistance, with consequent loss of appetite, malaise, lassitude, etc., in turn aggravate the oral conditions, and thus a pathological cycle is established, the consequences of which may vary in severity from general malaise to symptoms of such intensity as to endanger the life of the individual thus affected.

The discomfort resulting from aching teeth is as a rule unbearable; that which is consequent upon diseased alveoli is almost invariably bearable. Caries attacks the body openly, while pus-producing diseases of the alveoli do not. The former announces its progress; the latter silently undermine the health of the unsophisticated sufferer.

Many cases are to be found on record in substantiation of the claim that systemic diseases of the most severe type are not infrequently caused by unsuspected suppurative conditions of the oral mucous membrane. The following cases, from a paper by Mr. J. F. Colyer of London, England, which appeared in the *Journal of the British Dental Association* for July 1902, are herewith appended, as they represent typical instances of the condition under discussion:

> *Case I.* Maggie H., aged twenty-nine, was admitted to the Beckenham Cottage Hospital, Christmas 1901, in a moribund condition. Large quantities of blood had been vomited, and the pulse, when it could be counted, which was only with great difficulty, was about 140. The patient was placed in bed on her back, and one-fourth gr. of morphin administered hypodermically. She was fed per rectum with nutrient suppositories and enemata of plasmon dissolved in water. Pil. plumbi cum opio, gr. v., was given by the mouth twice daily. At the end of three days the hemorrhage ceased, and water was given by the mouth. Mr. Arthur Colyer, who examined her mouth, found the teeth in a most septic condition; most of them were carious, and nearly all had fetid pus oozing from the sockets. As soon as the patient had sufficiently recovered, chloroform was administered and the mouth cleared of all septic teeth. The patient made a rapid recovery, and has had no recurrence of the gastric ulcer.
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> *Case II.* The second case was a female, aged twenty-six. She was admitted to the Beckenham Cottage Hospital in December 1900, with the following history: For seven years she had suffered from symptoms indicating gastric ulcer; she had been in many hospitals, with invariably the same result, namely, recovery for a time, followed by relapse. At the time of admission there was copious hemorrhage. Her mouth was in a most septic condition, and all the teeth were removed by Mr. Arthur Colyer under an anesthetic. Immediate improvement resulted, the patient being able in three days to eat and drink anything. Up to the present time, now nearly eighteen months, there has not been the slightest symptom of gastric trouble.
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> *Case III.* The patient was a woman, aged sixty-two, suffering from subacute gastritis. She suffered from severe intermittent sickness, and

gastric pain necessitating the use of morphin, of eight months' duration, with loss of weight and increasing weakness. Cancer was suspected, but on examination no sign of malignant disease was found in the stomach, the abdomen, the rectum, or the uterus. Constant complaint was made of a bitter taste in the mouth, and nausea, with loathing and distaste for all food. The tongue was coated with a dirty moist fur. The patient had artificial teeth in both upper and lower jaws. The plates were scrupulously clean, and the gums beneath the plates were perfectly healthy. There were only three teeth in the jaws, and these were decayed, suppurating around the roots, with pus welling up on pressure, a condition which had existed for about twelve months. There was no other sign of disease. A provisional diagnosis was made of gastritis caused by continual swallowing of pus. The roots were ordered to be removed. A week later the tongue was clean, the sense of taste returned for the first time for eight months, and there had been only one attack of gastric pain. In another week there was a return of the sickness, with vomiting, pain and slight fever. The vomit obtained was free from food; it was watery, with rusty flakes consisting of mucus, fibrin, catarrhal cells, leucocytes, and blood, the whole being loaded with streptococcus and staphylococcus (pus) organisms and a few bacilli. A diagnosis was made of infective gastric catarrh. As a local antiseptic three grains of salicylic acid were given thrice daily, peptonized milk as food, and counter-irritation was applied. There was complete cessation of all pain, and a steady recovery from that time onward. When the patient was first seen her weight was 9 st. 10 lb. [stone = 14 lbs.], and a month later (after her illness) it was 9 st. 6 lb. Two months later it had increased to 10 st. 6 lb. She reported herself well, and she has since remained well (after fifteen months).

Up to this time my suspicions regarding the teeth were based on general grounds. Knowing as I did how infective the organisms of dental caries were, such unhealthy teeth seemed to me to be possible sources of infection. I had had no proof that infection from decayed suppurating teeth might be the direct cause of gastritis, nor did I know of any observations showing this. This case was a particularly crucial one in this relation. Had the teeth as a whole been very bad—*e.g.* a number of decayed roots amidst fairly good teeth, the condition one so often meets with both in private and still more in hospital practice—and had I had them all removed and replaced with good artificial teeth, I could not have been sure that the resulting improvement was due to removal of the teeth as sources of infection, and not rather to improved appetite and better mastication. As it was, no change was made as regards new teeth—nor, indeed, was any necessary. The only change made was the removal of the three suppurating teeth, which had, the patient said, never caused her any trouble—indeed, she regarded them as "old friends" whose loss she greatly deplored. She said that she had "had them like that for twelve months or more"—her gastric trouble, be it noted, extending over about the same period of time.

I was able to demonstrate further in this case the infective nature of the gastric catarrh—the catarrhal exudation vomited being loaded with pus organisms three weeks after removal of the suppurating teeth.

The above cases are eloquent examples of the conditions to which we are endeavoring to attract the attention of the profession; for such conditions, as can readily be seen, may constitute the source of great discomfort and ill health. The public should be forewarned of the danger accompanying the onset of pericemental disturbances, and every effort, within reasonable bounds, should be made to institute means of conveying to the unmindful population such information as may lead to a proper appreciation and recognition of this series of pathologic phenomena and their sequelæ. To the laity pyorrhea alveolaris implies, if anything, the loosening or total loss of the teeth, but certainly not such severe complications as gastric ulcer, gastritis, pernicious anemia, broncho-pneumonia, malignant endocarditis, pyemia, lymphadenitis, etc. It is precisely these possible effects of the malady under consideration to which the attention of the public should be invariably directed, for when the thought of danger to life is introduced into the question and placed before their eyes, just so soon will they take steps to eradicate the source of infection in the mouth.

We consider that suppurative diseases of the mucous membrane and alveoli constitute, for the reasons above enumerated, a danger to the health of man far more intense than dental caries, and would consequently urge that a most emphatic appeal be made to the public, by those whose self-imposed duty it is to educate them in dental matters, not to disregard those localized symptoms which are the forerunners of pericemental disease. This phase of hygiene and prophylaxis has been sadly disregarded, although it offers to the energetic and humanitarian practitioner a wide field for most beneficent work.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by **JULIO ENDELMAN, D.D.S.**

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde*, No. 2, Zurich, 1906.]

DENTAL IRREGULARITY IN A SYPHILITIC. By Drs. Lesne, Loedrich, and Viollet.

The authors relate a typical case of hereditary syphilis presenting a number of characteristic manifestations, viz, double keratitis, bilateral deafness, and a deformity of the nose. In addition the patient presented the following dental malformations: Fourteen teeth were found in the mandible and thirteen in the maxilla. One of the upper molars was implanted in the nasal cavity, and another had erupted through the hard palate. The authors attribute the displacement of these teeth to some developmental disturbance of the osseous structure of the maxilla, brought about by the inherited infection. The dystrophic action probably manifested itself at the time of the development of the facial tubercles, namely, before the development of the enamel; for while as a rule in syphilitics the enamel is incompletely and defectively developed, in the case under consideration it seemed perfect.

[*La Odontología*, Madrid, June 1906.]

RADICULO-DENTAL CYSTS INVAGINATED IN THE MAXILLARY SINUS: DIAGNOSTIC SIGNIFICANCE AND TREATMENT. By Dr. Landete of the Faculty of Medicine of Madrid.

Radiculo-dental cysts are a complication of chronic pericementitis of great pathological significance. These tumors originate in the apical region of teeth containing devitalized and infected pulps. Beginning as a simple fungosity, which probably acts as a barrier against the further spreading of the infection, they gradually acquire a voluminous size, and in their growth they spare none of the surrounding structures and cause considerable pain. The growth of the fungosity takes place at the expense of the neighboring tissues, and when through non-ascertainable causes the semilunar space between fungosity and root becomes filled with a liquid substance, the growth of the tumor takes place more rapidly. It is as yet impossible to offer any adequate reason to account for the fact that in certain cases these growths do not reach a size greater than that of a grain of wheat, while in others they assume considerable proportions. The cystic cavity in its effort toward expansion dilates the surrounding osseous tissue, gradually attenuates it, and in time the osseous wall becoming perforated, the cyst finds its way through it and completes its development beyond the osseous boundaries. As the growth takes place invariably in the direction of least resistance, it is not at all strange that practically every tooth will give rise to cysts differing in evolutionary characteristics, and that they should be of more frequent occurrence in the maxilla than in the mandible.

One of the most common forms of cysts—the *raison d'être* of Dr. Landete's communication—is that which perforates the floor of the maxillary sinus and completes its development in that cavity. A dental cyst within the maxillary sinus causes a distention of the external surface of the maxilla, and the cheek being pushed outward acquires a spherical form. The buccal tissues, however, are not in such cases the seat of any inflammatory changes, the facial disfigurement being merely the result of pressure by the tumor against the soft tissues. The affected tooth giving rise to the cystic formation can be isolated by percussion, it being more sensitive than its neighbors. In addition it usually is the seat of caries, and is slightly movable on account of several previous acute attacks of pericementitis. Cysts, however, may likewise develop upon immovable roots of teeth which present no outward sign of caries. The most striking subjective symptom is pain; which may be compared with that caused by pericementitis, although as a rule it is rather bearable. It is at first localized upon the affected tooth, but later it radiates toward the neighboring structures, *i.e.* eyes, cheeks, nasal fossæ, ears, etc. A differential diagnosis should always be made between dental cysts invaginated in the sinus and inflammations and tumors of that cavity. The rapid evolution of acute sinusitis and the slow development of cysts should be invariably borne in mind.

The author has prepared a table in which he compares the symptomatology of maxillary sinusitis with that of dental cysts invaginated in the maxillary sinus which is herewith reproduced, for it will undoubtedly assist the practitioner in accurately determining the nature of the maxillary disturbance:

Chronic Maxillary Sinusitis.	*Invaginated Antral Cyst.*
(1) Escape of pus through the nasal fossa on the affected side.	(1) Absence of rhinorrhea.
(2) Pressure of pus in the middle meatus.	(2) Absence of pus.
(3) Subjective cacosmia.	
(4) Suborbital pain.	(4) Suborbital pain.
(5) Carious and devitalized teeth.	(5) Carious and devitalized teeth.
(6) Fränkel's sign. Heryng's sign. Vohsen-Davidsohn's sign. Garel-Bürger's sign.	(6) Presence of all the diaphanous signs.
(7) Exploratory puncture to confirm the presence of pus in the antrum.	(7) Exploratory puncture giving rise to a transparent and viscid exudate.

Tumors of the sinus, phlegmonous periostitis of the external wall of the maxilla, and tertiary syphilitic manifestations present characteristics so absolutely peculiar to each of them that it would not be possible to confound them with the invaginated cysts of the antrum. In addition, antral cysts are never complicated with glandular involvement.

Regarding the treatment of this variety of cysts which must of course be exclusively surgical, the author advocates the Caldwell-Luc operation, which consists in the removal of the anterior wall of the antrum, *per os*, and the complete curetting of the antral contents. Subsequently the cavity is treated with a solution of zinc chlorid 10 : 100, the wound is sutured and drainage is kept up through the opening in the nasal wall of the antrum at the level of the inferior meatus secured for this purpose during the operation. The essayist's experience in the treatment of antral cysts by the method here outlined has been pre-eminently satisfactory.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde,* No. 2, Zurich, 1906.]

TABULATION OF THREE THOUSAND EXTRACTED TEETH. BY PAUL MULLER, GENEVA, SWITZERLAND.

Out of a total of 3000 teeth extracted by Dr. Muller, 744 were from the mouths of men, and 2256 from the mouths of women. In this series the teeth more frequently extracted were the upper and lower right and left first molars and the upper and lower right and left first and second bicuspids. The upper lateral incisor, right and left, was in the case of the women the incisor most frequently sacrificed to the forceps.

Following is the tabulation of the 3000 extracted teeth:

TEETH.	*Men.*		*Women.*	
	Upper.	Lower.	Upper.	Lower.
Right third molar...	16	15	49	41
“ second molar..	25	39	78	93
“ first molar....	50	77	117	149
“ second bicuspid	31	31	81	75
“ first bicuspid	36	15	110	52
“ canine	7	6	66	24
“ lateral incisor.	13	5	101	21
“ central incisor	14	...	58	11
Left central incisor..	7	...	57	16
“ lateral incisor..	15	2	96	19
“ canine	10	3	68	21
“ first bicuspid..	37	16	116	36
“ second bicuspid.	34	12	111	83
“ first molar......	58	76	122	134
“ second molar...	25	48	79	97
“ third molar....	10	11	33	42
Total (3000).....	388	356	1342	914

REPORT ON THE CONDITION OF SCHOOL CHILDREN'S TEETH. By Prof. Dr. Jessen, Strasburg, Germany.

Dr. Jessen reports the astounding fact that out of a total of 100,000 school children from the different German states, from 81 to 99 per cent. were found to have diseased teeth, and that practically only 1 per cent, had normal healthy mouths. The examinations of the teeth of the school children of the city of Berlin showed, according to Dr. Ritter, that 90 per cent. had defective dentures. The city authorities of Mülhausen, having undertaken the examination of the teeth of the pupils of the elementary schools, found that 99½ per cent. had diseased teeth. From a total of 9524 children examined, only 41 had sound dental organs, and only one pupil, who had recently returned from America, had an absolutely perfect denture. Following these alarming revelations, Mülhausen, inspired no doubt by the example of Strasburg, has established a city dental dispensary in which all children are treated free of cost. In addition, the cities of Ulm, Frieburg, Bielefeld, Leipzig, Zurich, and Frankfort are planning the erection of similar institutions; while Strasburg, Darmstadt, and Offenbach have had public dental dispensaries in excellent running order for years past. In the public dental clinic of Strasburg 17,119 children were treated in 1902; 17,054 in 1903; 18,073 in 1904, and 17,241 in 1905. The expenses incident to the treating of these children amounted to 2300 marks in 1902; 2750 marks in 1903; 5430 marks in 1904; and 6700 marks in 1905.

[*La Clinique*, Paris, June 29, 1906.]

TREATMENT OF PERICEMENTITIS. By Dr. Emile Sauvez.

As a counter-irritant in the treatment of pericementitis, Dr. Sauvez recommends a preparation consisting of equal parts of tincture of iodin, tincture of aconite, and chloroform. The mixture should not be applied upon the gum with a brush, but by means of an orange-wood stick around the end of which a small amount of cotton has been wound. The cotton saturated with the solution is held for a short time in contact with the gum immediately below the neck of the tooth.

[*Dental Record*, London, May 1906.]

CASE OF HEALING OF COMMINUTED FRACTURE IN ROOT OF CENTRAL INCISOR. By George W. Watson, L.D.S.

The author reports the following interesting case from the practice of Dr. C. H. Mathers of Belfast: The patient, a man aged twenty-four years, suffered a blow on the mouth from a cricket ball, which loosened the upper right central incisor, eight years prior to his consulting Dr. Mathers. The tooth had been loose and painful for a month after the accident, and had been misplaced slightly inward. During this time the patient abstained from using it as much as possible, and eventually it became well and serviceable again. Some years afterward caries appeared on the distal and mesial surfaces of the tooth, and the pulp having become exposed underwent necrosis. As the patient required an upper artificial denture, and as the central incisor was the only tooth remaining in the maxilla, it became necessary to extract it. The tooth after extraction exhibited a deep somewhat irregular crescentic groove on its labial surface at about a quarter of an inch from the apex, and continued half-way around the median and distal surfaces. Radiating from the extremities of the groove, a series of comminuted fractures running in all directions could be seen. The labial crescentic groove was probably caused by the fractured portion corresponding to the groove having been removed by absorption—the presence of numerous Howship's lacunæ confirming this supposition. It is extremely interesting to observe that repair had taken place from the pulp side, the fractures external to the root not being filled up in the slightest degree. If a fine explorer is introduced into the root-canal a slight protuberance can be felt, showing that a deposition of repair tissue had taken place. If it had been a transverse fracture, in all likelihood it would not have healed at all, but being vertical the parts were kept immovable, thus enabling the process of repair to take place more readily.

Fractured teeth, when the line of fracture is vertical or nearly so, should not be extracted immediately after the occurrence of the traumatism, but should be given an opportunity for the process of repair to set in and remedy the damage.

[*Dental Brief*, Philadelphia, August 1906.]

AN EASY WAY TO REPAIR A BROKEN FACING. By Dr. Frank S. Osborne, Columbia, Tenn.

Select a suitable facing, and by means of a pair of pliers bend the ends of the pins until they touch, thus forming a semicircle. With a small piece of No. 22-k. solder unite the end by gradually warming up the facing, held by a pair of pliers over a Bunsen burner flame. With a round bur, drill a slot in the body of the crown, using the pins of the broken facing as a guide. Now try the facing in, and grind it until a perfect joint is obtained. After the facing has been ground to fit, with a small round bur drill a hole from the lingual surface of the backing to the previously made slot, directing it to a fraction beyond the gingival border of the slot, until a pit is obtained sufficiently deep to retain the pin that is introduced into the hole to retain the facing. Having accomplished all these steps, select a piece of gold or iridio-platinum wire of a diameter equal to that of the vertical hole. Mix some cement thin and fill the slot; place the facing in its correct position with the soldered pins in the slot, and push the pin to place through the hole in the body of the crown. After the cement has set, with a stone grind off the pin, and burnish it thoroughly until a smooth surface is obtained. This method is applicable to bicuspid crowns or dummies, except that the hole is drilled from the occlusal surface instead of the lingual.

[*La Estomatología*, Madrid, June 1906.]

TREATMENT OF GANGRENE OF THE MOUTH (NOMA). By Ramon Pons, Barcelona, Spain.

Gangrene of the mouth, or noma, is seldom if ever a spontaneous disease, it occurring invariably as the sequelæ to protracted attacks of illness. It develops in weak, ill-fed children of unhygienic communities subsequent to attacks of pneumonia, enteritis, typhoid fever, diphtheria, smallpox, scarlet fever, and particularly measles. Its etiology remains as yet in the dark, especially from the bacteriological point of view, as all efforts to isolate the bacterium supposed to be the direct cause of the malady have thus far been unavailable. The symptoms first observable are swelling of the affected half of the face, including such structures as the cheek, lips, chin, and occasionally the eyelid; in the interior of the mouth a white and decidedly painless spot appears surrounded by a circle of bluish-black color. The spot is soon transformed into an ulcer, which rapidly spreads laterally and in depth, and acquires a blackish color, eventually destroying the cheeks, lips, and gums; the teeth become loosened and drop out; salivation becomes sanious, and the breath acquires an extremely offensive odor. While at first the general condition of the patient may be relatively good, it gradually becomes weak; the face assumes a livid appearance, and the disease becomes complicated with pulmonary and intestinal disturbances. Eventually intense diarrhea sets in, followed by vertigo, collapse, and death. In some cases death is preceded by hemorrhage of the maxillary and external carotid arteries.

The prognosis of noma is always serious, the disease ending fatally if not arrested in its first period, although there are several cases on record in which complete recovery occurred even after the disease had gained marked headway. The treatment consists in limiting the spread of the gangrene by the application of such strong cauterizing agents as nitric, hydrochloric, or carbolic acids, acid nitrate of mercury, unslaked lime, caustic potash, silver nitrate, etc. Dr. Gonzales Alvares has reported a case cured by the application of a solution of methylene blue 2 : 100 at intervals of four hours, and another practitioner reports a cure brought about by frequent washing of the affected area with a hot aqueous solution of salicylic acid 11 : 1000. Of late the use of red light has been recommended. The light should be reflected from a red lamp placed at a distance of ten inches from the face upon the ulcerated area for days and nights without intermission, with the exclusion of all other rays.

[It is advisable in this connection to refer to a case of recovery from noma after the disease had made extensive progress, as reported in the July *Medical Chronicle* by Dr. E. D. Telford, surgeon to the Manchester Hospital for Sick Children. The attack of cancrum oris began to develop about a month after recovery from an illness, supposedly bronchitis, although its true nature will remain doubtful. as the child had no medical attendance whatsoever. Seven days prior to the child's admission to the hospital, her mother noticed a black patch on the right cheek. The cheek was soon perforated, and the ulceration spread so rapidly that upon her entrance to the hospital the right half of each lip was entirely destroyed, and an area slightly larger than the size of a silver dollar was missing from the cheek. Dr. Telford began the treatment by excising all the diseased soft parts, removing the loose bone and teeth, and swabbing the wound with pure carbolic acid. Immediately after the operation a subcutaneous injection of 2000 units of anti-diphtheric serum was given, and was followed shortly afterward by another injection of 4000 units. During the following week 2000 units of the serum were administered daily, and the child's strength was kept up by the free administration of stimulants and fluid nourishment. The spread of the infection was completely checked, and in about ten days after the administration of the first injection of anti-diphtheric serum, the wound was covered with healthy granulations. In a few weeks' time, the patient having entirely recovered, the facial deformity was corrected by means of a plastic operation. Dr. Telford shares the opinion of some investigators to the effect that the diphtheria bacillus is the direct pathogenic factor in the causation of noma, and in the case under consideration the anti-diphtheric serum treatment was responsible, if not wholly, at least to a great extent for the recovery. It should be added, that the nurse who took care of the little patient was soon seized with sore throat, and although there was no false membrane or other clinical sign of diphtheria, diphtheric bacilli were found in swabbings from her fauces.—ED.]

[*New York Medical Journal*, New York, July 21, 1906.]

TREATMENT OF LEUCOPLAKIA. BY DR. MILLIAN.

The author (*Le Bulletin Medical*, May 5, 1906) considers leucoplakia as a symptom rather than a disease, and includes under this title all white patches of mucous membranes of a persistent character. This lesion especially selects the region of the tongue and the mouth for its manifestations, but may appear upon any mucous surface. It may be smooth or attended by the development of tubercles, papules, erosions, ulcerations, or sclerosis. Dr. Millian doubts the existence of the so-called idiopathic leucoplakia, which he regards as identical with syphilis. In at least eighty per cent. of the cases this diagnosis can be confirmed by the clinical history. In rare instances the lesion from the beginning is epitheliomatous. As regards the treatment of leucoplakia, after eliminating from consideration all the lesions of which it may be the symptom, and which have their own appropriate therapeutics (epithelioma, lichen planus, hydroa, etc.), there is a group to be considered which is syphilitic, either acknowledged or suspected. The general treatment will therefore be anti-syphilitic. Potassium iodid, however, is of no use; mercury in some form is the efficient remedy. The treatment must extend over many months, as the disease is extremely chronic. In ordinary cases, the only local care required is in the direction of protecting the mouth from all irritating substances, such as strong dentifrices or caustic applications. The mouth and teeth must be kept clean by gargles and the use of the tooth-brush. Alcohol and tobacco in all forms should be strictly forbidden. .

PERISCOPE.

To Prevent Bubbling of Borax.—Mix a minimum of gum arabic and water with the borax on a glass slab.—*Internat. Dental Journal.*

Spray the Gum.—Did you ever spray ethyl chlorid on the gums around the root of a tooth that you were preparing for a crown? Try it and your patient will repay you for your trouble.—*Amer. Dental Journal.*

To Prevent Hypodermic Needles Rusting.—Simply dry the needle out with blasts of hot air from the chip-blower. Throw away the little wires, and you will be surprised to learn how long your needle will last.—C. E. CONLEY, *Dental Review.*

To Soften Calculi.—Before removing salivary or serumal calculi it will be found advantageous to apply tincture of iodin. A few such treatments will tend to disintegrate the deposit and thus facilitate its removal.—E. M. S. FERNANDEZ, *Dental Review.*

To Polish a Porcelain Crown or any Porcelain Tooth that has been Ground.—Make a very soft paste by mixing spirits of turpentine, gum camphor, and pumice flour. Keep your polishing wheel wet with this mixture while repolishing the tooth.—W. H. SPAULDING, *Dental Summary.*

Filling Material for Deciduous Teeth.—I believe there is no filling material for deciduous teeth as satisfactory as base-plate gutta-percha, especially in approximal cavities. It works as a twofold blessing, closing the cavity and procuring the space required for the insertion of the permanent filling at a future time.—R. M. PEARCE, *Dental Review.*

Gold Plating.—So far as experience has shown up to the present time, it is impossible to gold plate any base metal so that it will not tarnish in a short time when placed in the mouth. Every expedient known in the plater's art has been tried, even to the extent of plating four or five deposits on previous deposits of nickel and copper, but the effect seems the same in all—the plating is lost in a short time. The best results are obtained by triple plating, *i.e.* three coats, one after the other, with a thorough burnishing between each coat, using cold solutions and a current of very low voltage. This makes a hard and fine-grained deposit, not of such brilliant color as by other methods, but the most durable that has been produced. Even this, however, tarnishes through in a few weeks in most mouths.—*Western Dental Journal.*

Colored Arsenic Mixtures.—Dr. G. V. Black long ago suggested that we mix our arsenic with sufficient lampblack, so that when placed within the tooth it may be seen plainly where it lies, and we may be able to detect any particles that might be disposed to crawl out of the cavity, and also in order to insure a complete removal of the dressing after the pulp has been devitalized. Anyone who will take the trouble to put up, or order from the druggist, a mixture of arsenic, morphin, and cocain, with lampblack in sufficient quantity to make a dull black, and will use this mixture for a time, would never think of doing without it.—GARRETT NEWKIRK, *Dental Review.*

Occlusion for Bridges.—In determining upon the occlusion of a bridge, we must remember that the life of the bridge is the life of its weakest anchorage. In a bridge supported by two teeth, one a multi-rooted and the other a single-rooted, both in the same condition of health, if the forces of mastication bear equally on each tooth, the single-rooted one will loosen first, even if the force be not applied at an angle to its long axis, as is usually the case in single-rooted teeth. Hence it follows that if you favor that tooth at the expense of the other i the arrangement of occluding surfaces, you will have increased, to some extent, the life of the appliance.—S. H. VOYLES, *Dental Brief.*

Efficient Method for Anesthetizing the Pulp Through Occlusal Cavities in Molars and Bicuspids Without the Use of the Pressure Syringe.—Prepare the cavity in the usual way, then place a pledget of cotton saturated with cocain solution directly over the pulp, and fill the remainder of the cavity with a piece of vulcanite. Take a short piece of orange-wood, fit it into this cavity as prepared and direct the patient to bite down upon it with increasing force. In this way we can obtain a well-directed, regulated force or pressure, and with less discomfort to the patient and operator. In our daily clinics we have succeeded in anesthetizing pulps by this method after repeated attempts by other means have failed.—E. T. Loeffler, *Dental Summary.*

Infected Third Molar Sockets.—The following treatment is suggested: First of all, the use of tepid water, sterilized, or if preferred, with the addition of boric acid. After washing it thoroughly, the socket may require curettement to insure the removal of any abnormal growth resulting from the infection and the inability of the tissues to heal normally. In cases of continued pain, camphorated oil gives relief in mild cases, but if extreme anodynes are necessary, one-eighth grain of morphin, incorporated with balsam of Peru and iodoform (odorless), made into a paste, may be carried to the floor of the socket in a pledget of cotton, and sealed with Fletcher's carbolized resin and cotton, subsequently reducing the size of the dressing as the socket closes. In case of enlarged submaxillary and parotid glands, the use of one part tincture of opium and two parts leadwater applied on flannel and wound with a hot cloth for an efficient (external) application for the relief of pain.—Jas. W. Winn, *Dental Headlight.*

Method of Making Amalgam Dies.—Amalgam dies have become very popular for constructing gold and porcelain inlays, copes for crowns, and also for building up with gold teeth that have decayed far below the gum margins. Take an impression with pink baseplate gutta-percha in the following manner: Moisten the tooth and cavity with glycerin. Soften the gutta-percha over an alcohol flame, being careful not to blister it, and then force the gutta-percha into the cavity with a broad instrument. The glycerin will prevent the gutta-percha from sticking to the cavity. Flow a stream of cold water over the gutta-percha to harden it; carefully remove it and if the margins are perfect, mix a small quantity of plaster, build it to a pyramid on a glass slab, and invest the impression by forcing it down in the plaster with an instrument, being careful to have the plaster well up around the margins. When the plaster is hard, mix the amalgam. I prefer to use alloy in the form of shavings, or copper amalgam, which is better still, as it can be used over again several times by warming it until the mercury appears on the surface, and then grinding it thoroughly in a mortar. Carefully pack the amalgam around the impression until it is well covered, and then roll up a piece of vulcanized rubber, about the size of a thimble, and wrap several thicknesses of rubber tape around this. Place it over the amalgam, insert in a vise and squeeze out the mercury. Leave it under pressure three or four hours or over night. Then break away the plaster, remove the gutta-percha, and you will find a clean-cut and polished die which is easily mounted in the swage, and upon which a perfect matrix can be prepared.—C. J. Hadley, *Dental Review.*

Cocain Anesthesia.—I have seen so much injury to the gums, alveolar process, and bone resulting from hypodermic injections, that I would prohibit the use of cocain in my office if I thought the trouble arose from the use of cocain *per se.* But I am of the opinion that the trouble frequently arises from septic matter carried into the tissues beyond by the needle, rather than by the irritating properties of the drug itself. A thoroughly aseptic needle may, and often does, carry infectious material from the mouth into the tissues, and thus cause serious trouble. It is a well-known fact that infectious material in the mouth, and about the necks of the teeth, is often carried into the general system by the beaks of the forceps in extraction, causing serious trouble. It is also well known that cocain is a very unreliable drug in its effects upon different individuals. But its injudicious, indiscriminate, and improper use has doubtless caused a very large part of the trouble that has been blamed upon the drug itself.—C. P. Pruyn, *Dental Review.*

Cementing the Inlay.—Place the napkin in the mouth, and wipe out the cavity with cotton. Then arrange a generous amount of the cement powder and liquid on a glass slab. A bone spatula must be used. Take a piece of linen tape eight inches long and half an inch wide, and place it where it can be taken up quickly. It is convenient in handling the inlay and easier to place it, if you will attach it by varnish to a wedge-shaped piece of orange-wood. Everything must be ready because you must work fast; there is no time to hunt for instruments or pick up the inlay two or three times, as the cement will harden before one can get the inlay to place. Mix the cement as thick as you can and be sure the inlay will go to place. Place the cement in the cavity with a small instrument such as a canal plugger bent at an obtuse angle. See that the cement covers every wall, and that it is in the seat of the cavity and over the margins. Now insert the inlay, and with the tape between the teeth, force the inlay to place with a drawing motion that will press it into the resistance seat. Hold it thus for ten minutes. The tape does two things: it gives equal pressure on all parts of the inlay, and wipes the joints free of excess cement. I consider this last point an important one, because it is better to have the cement harden with the natural gloss to protect it, than to leave an excess over the joints and cut it off after it has hardened. For when you try to cut it off with a disk or stone there is going to be a breaking away of the cement from the joints which will extend below the margin. When the tape is removed, varnish the joints. If the linen tape is too thick use strips cut from architect's cloth—this is thin and very strong. The inlay may not be as good a shade as it was before it was cemented in. but when the cement matures and washes away from the margins, great improvement will be noticeable.—G. F. WOODBURY, *Tri-State Dental Record.*

The Hands and Operative Accessories: How to Sterilize.—The hands should be thoroughly washed and the nails brushed immediately after treating a patient, and if any interval elapse, immediately before seeing another. (Personally, I prefer the patient to witness this precaution.)

In cases where one is conscious of having come in contact with any virulent infection, the hands should be thoroughly cleaned by means of very hot water, soap, and a nailbrush, and then well scrubbed with a two per cent. solution of lysol or a four per cent. solution of lysoform, and finally immersed in a solution of mercury perchlorid 1 : 1000, for not less than two minutes. New rubber dam should be thoroughly washed with soap and water, or better still, boiled before using. Anyone who has not practiced it will be astonished at the amount of impurity removed in this process, and it certainly offends the canons of good taste to allow the patient to suck this off, though there may be no question of any specific disease germ.

I have never been able to see any objection to the use of a rubber a second or third time, provided that it has been boiled for ten minutes and thoroughly scrubbed with soap or lysoform and water. I should much prefer it to dirty rubber straight from the depot. But there must be no mistake about the sterilization. Silk may be used from a reel inclosed in a box suspended by a wire, pieces being cut off as required.

Saliva tubes, if of glass, should be of clear glass, so that one may be able to see whether they be clean or not. The only object in using colored glass is the concealment of dirt. A fresh tube should be used for each patient. Immersion in strong hydrochloric or sulfuric acid, and subsequent rinsing, will keep them bright. Boiling makes them cloudy. Metal tubes should be boiled; there is no other way of dealing with them. A supply of clean tubes may be kept at hand in a weak solution of lysoform, in a covered glass dish. Each patient should be given a clean tumbler. A napkin should never be used twice without washing, and the washing must be thorough. The cheap napkins which are now sold, to be used once and thrown away, have much to recommend them. Impression trays should be thoroughly washed and polished when the impression material has been removed. Impression material may be effectively sterilized without damage by placing it in a double saucepan with a lid having a hole in it for a thermometer, and keeping it at a temperature of 160° F. for one and a half hours.—J. H. BADCOCK, *British Dental Journal.*

How to Take an Impression Bite.—It may be true that perhaps a large proportion of the profession take a bite differently from the mode which I am about to describe. I believe that this is due to being instructed differently in the beginning, and not to logic, nor to the study of the principles involved. They simply do day after day that which was taught them in early years, and never give a thought to the possibility of improving the results. In taking a pressure bite I use only one base-plate, preferably of a hard nature such as Ideal base-plate, metal, or vulcanized rubber where a combination plate is to be made. The base-plate is for the upper cast only. On this plate we put a large roll of soft wax, about as wide as you estimate the jaws will naturally be apart when in their normal relation to each other. Place the base-plate and roll of wax together in the patient's mouth, raise the chin up, the head back, and instruct the patient to swallow. I have them repeat the act of swallowing two or three times at short intervals, but do not instruct them to bite. They will bite a little of their own accord. We remove the base-plate and wax in one piece from the patient's mouth, and place it in cold water until it is hard throughout its entire thickness. We then, with a warm knife, trim away all the surplus wax, from lingual, labial, and buccal surfaces, leaving only a slight imprint of the mandible. With this—which is only one piece to handle, and is hard and well fitted to the upper mouth, due to a good-fitting, hard base-plate—we now proceed to take the actual pressure occlusion bite.

A very small roll of warm wax, not larger in diameter than a lead pencil, is placed around in the imprint of the mandible as it is seen on this first and now hardened wax bite. You notice that you still have only one piece to handle. We do not have to try and try again to hold the lower half of the bite in place while we are getting the upper half in place. All we need is to be sure that the base-plate is in its proper position on the maxilla. Hold it up by inserting the finger nails of your two index fingers into the hardened wax. With the head thrown back, instruct the patient to swallow, and just at the moment they do swallow, not before, tell them to bite hard and hold their teeth together tight. While in this position, we will mark on the wax the lip line, the median line of the face, and the corners of the mouth. While doing this stand directly in front of the patient. Carefully remove the bite and base-plate, which are now all one piece, place in cold water, and when cold, trim away the surplus wax of the last bite with a hot knife.—FREDERICK H. BERRY, *Dentist's Magazine.*

Limit Lines of Plates and Palatal Configuration: Vacuum Chambers.—In upper plates our aim should be to just escape the muscular and ligamentous attachment all the way around the margin. In front the lip band or superior labial frenum should be considered in trimming, and the rim of the plate cut out to give free play. In some cases this is unusually near the occlusal surface of the ridge, and should be trimmed slightly away with a bistoury or surgical scissors, using an obtundent. The plate from this point should mount well up over the canine eminence. Many of the plates seen today do not reach high enough, nor are they contoured or thickened enough at this part to preserve the natural features. From here the plate should follow the muscular attachment over the bicuspids, and descend just enough to fit free of these parts, ascending again as it extends back, passing well over the maxillary tuberosities to form the heel of the plate. These results are not easily attained with the ordinary impression trays. We should use as deep a tray as possible. Those designed after Dr. Angle's ideas are the best, in a majority of cases, to obtain a cast showing the condition of the mouth high up over the ridge and into the soft attachments of the parts. Our trouble has always been in using a tray with a narrow rim, and not securing an accurate cast of the mouth. As a rule, the posterior limit line of a plate should be farther back than we find most of them, especially in flat-arched mouths; and should be thinned and beveled so as not to form a sudden offset between the ending of the plate and the soft palate. The plaster cast should be scraped at the distal margin to permit the plate to embed itself into the soft tissues of the palate. The plaster cast should also be slightly altered on the buccal and labial walls, so that the rim of the plate will hug the tissues closer at these points. Just midway between the occlusal surface of the alveolar ridge and where the soft tissue loses itself in the body of the bone, it permits of some compressibility without irritation. Plates constructed along these lines should have firm stability in the mouth. Vacuum chambers rarely do any good, no matter how formed, and often work a positive harm to the stability of the plate and the tissues of the mouth. Especially does this hold good where the central rhaphe is prominent and bony, and the mucous covering attenuated and stretched. Palatal nodules in the upper arch are always to be viewed with gravity; and careful examination and study should be made of the topography of the parts so as to give relief to the hard places, thus equalizing the pressure with the soft places in the roof. Assuming that a correct cast has been obtained, in full lower cases the plate lines should receive very careful attention, as much of the success of the dentures depends upon their shape. In this connection it may be said that many impressions are correct only so far as they go; but they do not go far enough. The cast should be accurate especially at the postero-lingual portion of the ridge at the angle of the ramus, or at the floor of the mouth under the posterior portion of the tongue. Plates are not often extended down the side of the ridge enough at this point. When there is extensive resorption, a wide and full rim should be used, provided a proper representation of the parts can be obtained. It will add much to the stability of the denture, and to the comfort of the patient who is so unfortunate as to have to wear a lower plate. Nodules of a hard, bony character are also found on the lower alveolus, usually on the lingual side opposite the second bicuspids; while these protuberances are healthy, they are sensitive, and the rim of the plate should not be permitted to ride upon them as hard as upon the rest of the ridge. The lingual surfaces of lower plates are often made too thick for proper movement of the tongue. The teeth are often either so deeply embedded within the vulcanite, or the teeth have such a poor lingual surface, that the tongue does not feel a difference between the teeth and plate. The lingual surfaces of bicuspids are usually too prominent and the other buccal teeth are not nearly prominent enough. The anterior teeth should also have broader, longer, and more pronounced lingual surfaces to simulate the natural teeth. This idea should be carried out also in the upper arch. There are few cases, indeed, according to my judgment, where short-bite teeth are indicated, but rather teeth in which all the surfaces are well formed, and then not embedded in the vulcanite. The lingual surface of upper plates should be gracefully formed to give freedom to the tongue and assist in articulation. The correct configuration of this part of an upper plate has much to do with its success as a useful and comfortable appliance. The rugæ should faithfully imitate nature. It is surprising how much easier it is to properly articulate and guide the movements of the tongue when rugæ exist than when they do not.

In some cases the plate is so formed just back of the six anterior teeth as to cripple the end of the tongue in its efforts to control sound and a whistling results, which is annoying and embarrassing to the patient. If the plate is so formed as to pass from the cervical margin of the lingual surface of the teeth at almost right angles to that surface, for about one-quarter of an inch, and then extend posteriorly in conformity with the arch, it will leave a ledge or shelf for the tip of the tongue to strike against in the pronunciation of certain words, and will shut off and control the sound.—E. M. KITTIG, *Dentist's Magazine*.

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OBITUARY.

DR. HENRY WESTON.

DIED, at his residence in Philadelphia, on Wednesday, July 11, 1906, Dr. HENRY WESTON, in the seventy-first year of his age.

In the death of Dr. Weston there passed one to whose fertile mind the dentistry of the past thirty years was not a little indebted for devices and preparations which simplify and facilitate practice. A very skilful dentist, he knew the points of difficulty, and applied his mind to making them easier for others. Personally a modest, rather diffident man, averse to notoriety, his works spoke for him, and in no uncertain terms, and his name through its connection with practical appliances is almost as "familiar as household words."

Henry Weston, the son of Dr. John Norris Weston and Nancy (*née* Dodson) his wife, was born at Towanda, Pa., December 29, 1835. His father was the leading physician of the vicinity and was also active in politics, having served two terms as sheriff of Bradford county.

The early education of the son was obtained at a private academy in his native town, presided over by the late Senator Orville H. Platt of Connecticut. His father died when he was twelve years old, and shortly thereafter the youth made up his mind to become a dentist. Accordingly, in 1852, at the age of sixteen, he journeyed to Baltimore, working his way down the Susquehanna river on a lumber raft. Arrived at Baltimore, he apprenticed himself to Dr. Henry Snowden—afterward of the well-known firm of Snowden & Cowman—to learn the mechanical branches of dentistry. His studious ways, his aptitude, and his rapid acquirement of skill, so impressed his preceptor that within six months he destroyed the articles of agreement and thereafter paid his pupil regular wages, which were increased at frequent intervals. Then the time came when he said, "Henry, I can teach thee no more. Go to Charles O. Cone; he wants thee, and thee cannot learn to fill teeth as well from any other man on earth."

Dr. Cone's skill as an operative dentist is one of the traditions of the early days of dentistry. In his office young Weston remained for several years, first as student and afterward as assistant. Then he began an independent practice at Harper's Ferry, Va., remaining there until the time of the John Brown raids in the fall of 1859, when he returned to his native town and opened an office there. The business prospered, and in 1864 he married Miss Margaret Christian, a young lady from St. Leonard-on-Sea, Sussex, England, who had crossed the ocean to visit friends in Towanda.

Shortly afterward Dr. Weston decided to go West, and accordingly he and his wife removed to Berlin, Wis. They remained there, however, only about six months, and in January 1865 returned to the East, residing for a few months in Philadelphia, where Dr. Weston often assisted the late Dr. McQuillen. In the spring of that year he reopened his office at Towanda, where he remained eight years; then again removed to Philadelphia. There also he was successful, rapidly securing a considerable practice.

By this time he had begun to turn his mind in leisure moments to the devising of preparations and instruments for the betterment of dental practice. The first of his productions was Weston's metal, for making lower dentures, which with some modifications is still, after the lapse of more than thirty years, quite largely used. Close upon this followed a line of cements and alloys, all of which may be regarded as steps in the evolution of those in use today. The most important of these was Weston's Insoluble Cement, which is and has been probably as well known and as largely used as any other ever offered to the profession. Dr. Weston also developed a number of instruments—pluggers, chisels, etc.—some of which still hold their place in the dental armamentarium.

In the early '80's he invented a method of braiding wire for the manufacture of cushions, pillows, etc. To exploit these a stock company was formed, which was quite successful for several years, under the name of the Weston & Wells Braided Wire Co. A branch manufactory was established in England under the name of the American Braided Wire Co., of which Dr. Weston became the president and manager, necessitating his residence in England, where he accordingly lived for a number of years.

He never actively engaged in the practice of dentistry after his return to America—a fact which is to be regretted, because he was a resourceful practitioner of great skill and master of both branches of practice. He brought to the operative practice a sympathetic nature, a gentleness of manipulation, and a delicacy of touch which assured to his patients relief from all but the most unavoidable pain in operating. Strongly endowed with the artistic temperament, his work was that of the master. As giving some idea of his rank as a practitioner, it may be said that when he was practicing in Philadelphia the late Dr. Samuel S. White and his family were numbered among his patients.

In attaining an end Dr. Weston was patient, persistent, untiring. No matter how great the work, he never wearied until it was brought to a successful issue. The bringing out of his insoluble cement was a prodigious labor. He knew what he wanted to do, and knew the properties of the various ingredients which might be useful in the cement; knew something of their modifying effects on one another when brought together. On this basis, steadily pursuing the end desired through a term of years, he conducted thousands of experiments before attaining success. In each the ingredients and proportions and the various steps of the manipulation were noted, the effects observable at different stages were recorded, and the final results tabulated and collated for reference.

He was a man of kindly disposition, as was shown in his handling of patients; those who passed under his ministrations were his firm friends. A generous man, he gave freely of his stores of practical knowledge, delighting to help students and young practitioners over rough places. A devoted husband, a fond father, his home life was consequently ideal. He was always a cheerful and pleasant companion. His courage and cheerfulness were shown under the most trying circumstances in the long and painful illness of over a year which preceded his death. Suffering under a complication of troubles which left him scarcely a moment's respite from pain, he was always almost vivacious, greeting his friends who called to see him with a smile and a joke, never once allowing his pains to get the better of his buoyancy. Even after gangrene had set in and it was found necessary to amputate one of his legs, his cheerfulness never deserted him. He spoke hopefully of his recovery, looking forward, indeed, to attaining the great age at which his mother had died. His great vitality astonished his physicians, calling him back on several occasions from what seemed the verge of the grave. His patience under the suffering to which he was a martyr for several months before the end came was almost heroic—an example and a comfort to those he left behind. In this, as in his work for dentistry, it cannot be said that the good which Dr. Henry Weston did lies interred with his bones; it lives on, a grateful memory to those who partook of its beneficence.

F. L. H.

DR. WILLIAM SAUNDERS.

DIED, at his residence in Highland Falls, N. Y., Friday, August 3, 1906, WILLIAM SAUNDERS, hospital steward U. S. army, retired, and dental surgeon, in the seventy-first year of his age.

The death of Dr. Saunders breaks another link in the chain which bound the West Point of the past to the present. Though only a non-commissioned officer on the roster of the army, it is safe to say that no man in the service enjoyed a wider measure of popularity than William Saunders. For nearly a half-century he had been the dentist of the post, and he numbered among his friends all the graduates of the military academy during that long period. Many of them continued to be his patients long after their days at the academy ended. Of generous nature, his labor, his purse, his sympathy, his advice, his help were at the disposal of officer and enlisted man alike, without thought of return.

From General Orders No. 21, issued by Brigadier General Mills from the post headquarters, announcing the death, we make this excerpt:

"Dr. Saunders was born in England, September 19, 1835. He studied dentistry, and in 1857 was appointed hospital steward in the U. S. army, and was assigned to duty for dental work at the academy. In 1885 he was placed on the retired list of the army, but continued under special arrangements to practice dentistry among the officers and cadets of this institution until a short time before his death. In addition to his special work as dental surgeon he assisted in his capacity of hospital steward at many important surgical operations, and from a very early period of his career performed the functions of sexton for the post of West Point. Throughout his long term of service, covering half a century, his record is one of consistent devotion to duty; perfect integrity of character; high professional skill and boundless generosity.

"Dr. Saunders has endeared himself to successive classes of cadets and to officers, soldiers, employees, and their families, by numberless acts of personal kindness and sympathy, by his unfailing geniality of temperament, and by his unselfish devotion in times of sorrow, trouble, and distress to the many who have sought his aid and advice."

Funeral services with military honors due the grade of Dr. Saunders were held in the post chapel on Monday the 6th inst. Interment was made in the post cemetery, where it is intended to erect a memorial monument. Col. C. W. Larned, who will act as chairman of the memorial project, closes an appreciative tribute in the *Army and Navy Journal* in these words:

"Peace to you, William Saunders, kindest and best of hearts, faithful and skilful workman, generous, unswerving, and discreet friend! Simple and genial of life, who will fill for us your office of good-will, and where shall we find the sunny, never-failing spirits and jovial voice of greeting that endeared you to fifty years of West Pointers, high and low?"

DR. GEORGE BELL SALTER.

DIED, suddenly, of heart failure, Saturday afternoon, June 30, 1906, Dr. GEORGE BELL SALTER of Chicago.

Dr. Salter's death occurred at the Metropolitan Elevated station at the corner of Wabash ave. and Randolph st., Chicago. Although for some time he had not been feeling as well as usual, no serious difficulty was anticipated, but he had that day closed his office to take a long rest at the seashore.

George Bell Salter was born in Stark co., Ohio, October 6, 1837, and in 1845 his parents moved to Monroe, Mich., where he lived until 1857. He then went to Freeport, Ill., and studied dentistry. In 1859 he located in Whitewater, Wis., but went to Joliet, Ill., the following year and began practicing. His office was for years in the old Masonic Temple, corner of Ottawa and Jefferson sts.

Dr. Salter became a member of the Illinois State Dental Association in 1867, and at the time of his death was one of its oldest members. He continued active practice in Joliet until about 1892, when he opened an office in Chicago, at 827 Marshall Field bldg., where he was still practicing at the time of his death.

Dr. Salter married Miss Mattie Ellis of Whitewater, Wis., January 13, 1864, and had one daughter, Viola; both survive him.

Although best known as a dentist, he was also the inventor of many useful devices. Suffering as he did for over twenty years from total deafness, he nevertheless kept at the head of his profession, and was uniformly bright and cheerful, making the best of everything. Because of his deafness, he took up outdoor sports, and interested himself in archery, photography, bicycling, etc. He was also an ardent "century" rider—all his century rides being made after he was over sixty years of age.

Dr. Salter was primarily a home man, and was loved by all who knew him for his gentle character and high standard of morality. His home life was an inspiration to all who had the privilege of observing him in his domestic relations.

Funeral services were held in Chicago, and at Joliet, Ill., where the interment took place, on Tuesday, July 3d.

C. S. R.

DR. WILLIAM KAY.

Died, Monday, July 23, 1906, at his residence, 325 N. Fortieth st., Philadelphia, Pa., Dr. William Kay, after an illness, from acute dysentery, lasting one week.

Dr. Kay was born in Dumfries, Scotland, thirty-four years ago. His early education was received at the public schools, supplemented by a special course at a college preparatory academy in his native place.

After leaving school he entered and remained six years in the office of a practitioner well known throughout Great Britain, the late Dr. Wood. In 1892, at the age of twenty, he came to this country, and in 1893 entered the Philadelphia Dental College, graduating in 1896, since which time he has practiced in Philadelphia. In 1899 he became demonstrator of operative dentistry, and in 1904 demonstrator of crown and bridge work at the Philadelphia Dental College. He discontinued college work about a year ago.

Few excelled Dr. Kay in manipulative ability and manual dexterity, and his assistance was much sought when, prior to graduation and for a short time after, he undertook prosthetic work.

Dr. Kay was a member of the Pennsylvania State Dental Society, the Academy of Stomatology, the British-American Dental Society, etc. With a quiet and gentlemanly demeanor, he was retiring in disposition, and avoided prominent attention, other than that coming from an occasional clinic at a society meeting.

He was an earnest Christian and a prominent member of the Christadelphian Ecclesia, in which he took a very active interest

The funeral took place on Thursday, July 26th, the body being laid to rest in Woodlands Cemetery, Philadelphia.

He leaves a widow and three small children, a father, mother, and several brothers and sisters to mourn the early loss of a devoted husband and father, and a kindly son and brother.

T. J. McL.

"IN MEMORIAM" RESOLUTIONS.

Dr. Warren De Crow.

At a meeting of the Santa Clara County Dental Association, held May 15, 1906, the following preamble and resolutions were adopted:

Whereas, It has pleased God to remove from our midst and from our daily associations our esteemed friend, neighbor, and fellow-practitioner, Dr. Warren De Crow, of this city, whose untimely death occurred as a result of the recent calamity which has befallen our state; and

Whereas, We have been deprived of the genial companionship and ever-ready counsel and advice of one whose ability and knowledge, together with his unsullied reputation and his firm sense of honor, have caused him to be loved, and endeared him to the lasting memory of his associates; therefore be it

Resolved, That our association has lost a useful member, and our state an honored practitioner—one whose generous impulses and noble character hold our sincerest admiration; and be it further

Resolved, That we tender to his wife our heartfelt sympathies in this her great affliction: also

Resolved, That a copy of these resolutions be sent to his wife; also to the dental journals for publication, and that they be spread upon the minutes of this association.

E. O. Pieper, *Sec'y.*

SOCIETY NOTES AND ANNOUNCEMENTS.

NATIONAL DENTAL ASSOCIATION.

TENTH ANNUAL SESSION.

The tenth annual session of the National Dental Association will be held in Atlanta, Ga., commencing Tuesday, September 18, 1906.

The New Kimball House has been selected by the local committee of arrangements as headquarters, where all general sessions of the association and of the sections will be held. The rates per day at the New Kimball House will be—European plan, from $1.50 to $4.00; American plan, from $3.00 to $6.00, governed by choice of rooms.

Reduced Railroad Rates

A round trip rate of one fare plus twenty-five cents has been secured in all territory south of the Potomac and Ohio and east of the Mississippi.

In all other territory the rate of one-third fare on the certificate plan has been granted. Delegates will pay the full fare going to Atlanta, taking a receipt therefor, which will entitle a return at one-third rate. Tickets will be on sale accommodating those who attend the Faculties and Examiners Associations as well as the National Dental Association, and the return trip date is September 25th.

The Ocean Steamship Co. will on September 11th sell tickets at one rate plus $5.00 for round trip from New York, and one fare plus $6.00 from Boston.

J. D. PATTERSON,
Ch'm. Ex. Com.

Governor James M. Terrell will welcome the association to Atlanta, and Dr. D. D. Atkinson of Brunswick, Ga., on the part of the dentists of Georgia, will also deliver an address of welcome. To these addresses a response will be made by Dr. B. Holly Smith for the association. An old-fashioned Georgia barbecue is offered to the association in the way of entertainment, to be held at the "Cue Club" on an afternoon.

The general officers and those of the sections, as well as the committee chairmen and their members, have been working hard to provide an interesting and instructive program, and a large attendance is expected.

In one of the general sessions, Chas. McManus, Hartford, Conn., chairman Committee on History, will present an illustrated paper on "The Remarkable History of the Profession and the Splendid Character of the Men of the Past Who Helped to Build It Up," and A. W. Harlan, New York city, will present a paper on "The Blue Light and Heat as Therapeutic Agents."

Section I.

This section presents the following program of papers for consideration: "The Present Status of Porcelain Inlays," John Quincy Byram, Indianapolis, Ind.; "Orthodontia," Richard Summa, St. Louis, Mo.; "A Phase of Art in Prosthesis," George H. Wilson, Cleveland, Ohio; "Porcelain," C. N. Thompson, Chicago, Ill.; "Setting Crowns and Bridges with Gutta-Percha," L. G. Noel, Nashville, Tenn.; "Orthodontia," Victor H. Jackson, New York city; "Orthodontia," Calvin S. Case, Chicago, Ill.; "The Inevitable Outcome of Crown and Bridge Work," E. Parmly Brown, New York city; "General Practice," W. Leon Ellerbeck, Salt Lake City, Utah.

B. L. THORPE, *Ch'm.*, St. Louis, Mo.
D. O. M. LECRON, *Sec'y*, St. Louis, Mo.

Section II.

This section presents the following program of papers for consideration: "Manual Training an Essential to Dental Education," Burton Lee Thorpe, St. Louis, Mo. Subject not given: Geo. S. Vann, Gadsden, Ala. "Prosthetic Nomenclature," Geo. H. Wilson, Cleveland, Ohio; "The Nomenclature of Materia Medica and Therapeutics," A. H. Peck, Chicago, Ill.; "Operative Dentistry," H. H. Johnson, Macon, Ga.

HOWARD E. ROBERTS, *Ch'm.*, Phila., Pa.
C. S. BUTLER, *Sec'y*, Buffalo, N. Y.

Section III.

This section presents the following program of papers for consideration: (Subject to be announced), W. J. Roe, Philadelphia, Pa.; "Treatment of Pyorrhea Alveolaris with Stereopticon Illustrations of Cases Before and After Treatment," Gordon White, Nashville, Tenn.; Chairman's Address, "Review of Progress for the Year in Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects," by the chairman, the vice-chairman, and the secretary.

GEO. V. I. BROWN, *Ch'm.*, Milwaukee, Wis.
W. E. GRANT, *Vice-Ch'm.*, Louisville, Ky.
W. H. G. LOGAN, *Sec'y*, Chicago, Ill.

Oral Hygiene.

The Committee on Oral Hygiene promise an interesting summary of their work, illustrated methods of teaching the science to both dentists and laymen, essays, resolutions, and the report of the committee.

J. P. CORLEY, *Ch'm*, Greensboro, Ala.
F. W. STIFF, *Sec'y*, Richmond, Va.

Clinics.

CHAIR CLINICS.

Alabama.—Dr. J. H. Crossland, Montgomery: "Stomatic Prophylaxis." Dr. J. P. Corley, Greensboro: "Teaching the Technique of the Dental Toilet."

Connecticut.—Dr. L. C. Taylor, Hartford: "Method of Filling Small Cavities in Children's Front Teeth (ten to twelve years)."

Georgia.—Dr. W. E. Bugg, Madison: "Combination of Soft and Cohesive Gold, Using the Crenshaw Matrices."

Indiana.—Dr. J. Q. Byram, Indianapolis: "Porcelain Inlay for Approximo-incisal Cavity."

Iowa.—Subjects not given: Dr. J. V. Conzett. Dr. W. R. Clack. Dr. F. T. Breene. Dr. C. M. Work.

Kansas.—Dr. F. O. Hetrick, Ottawa: "Gold Filling, Using Combination of Mat and Foil in Mesio-occlusal Cavity in First or Second Molar."

Massachusetts.—Dr. G. A. Savage, Worcester: (1) "Porcelain Jacket Crown." (2) "Porcelain Restoration."

Missouri.—Dr. Wm. Conrad, St. Louis: "Some Uses of Nitrate of Silver." Dr. H. F. Cassel, St. Louis: "Difficult Partial Impression in Plaster."

New Hampshire.—Dr. A. W. Woodman, Plymouth: "Cavity Preparation and the Insertion of Cohesive Gold," or, "Extraction, Using Somnoform."

New York.—Dr. N. S. Shields, New York: "The Use of Keeton-Williams Gold in Combination with Cement."

North Carolina.—Dr. F. L. Hunt, Asheville: "Porcelain Inlays: Cervical Cavity Restoring Recession of Gum with Pink Enamel." Dr. I. N. Carr, Durham: "The Real Cohesive Property of Ambler's Cohesive Tin Foil."

South Carolina.—Dr. A. P. Fleming, Spartanburg: "Hollow Retention for Gold Inlays." Dr. J. T. Crymes, Greenwood: "Amalgams."

Virginia.—Dr. F. W. Stiff, Richmond: "Ivory's Crystal Alloy with Watt's Gold."

Wisconsin.—Dr. W. H. Cudworth, Milwaukee: "Porcelain Inlay Restoration, Central Incisor." Dr. F. G. Van Stratum, Hurley: "Restoration of Central Incisor, Using Platinum and Gold."

TABLE CLINICS.

Alabama.—Dr. L. G. Pierson, Selma: "An Original Method of Bridge Work Without Showing Any Gold." Dr. J. C. Chisholm, Selma: "Esthetic Bridge Work." Dr. J. A. Hall, Collinsville: "A Temporary Inferior Denture, or An Emergency Set of Under Teeth."

Connecticut.—Dr. F. T. Murlless, Jr., Windsor Locks: "The Use and Manipulation of Gutta-percha." Dr. E. S. Gaylord, New Haven: "Rapid Method of Obtaining Matrices for Inlays."

District of Columbia.—Dr L. T. Davis, Washington: "Use of Vulcanite Pinless Teeth in Crown and Bridge Work." Dr. H. P. Dawson, Washington: "Method of Lateral Bicuspid Attachment in Bridge Work, Preserving the Buccal Wall." Dr. S. Jaffe, Washington: "A Method of Utilizing a Live Bicuspid in Bridge Work Without Showing Gold." Dr. H. Porter Davis, Washington: "Refining Gold Scraps in the Dental Office." Dr. W. W. Evans: "Porcelain and Bridge Work, and Other Specialties."

Georgia.—Dr. J. H. Lorenz, Atlanta: "Inlays and Hoods for Bridge Abutments." Dr. W. C. Miller, Augusta: "The Impression, Model, Bite, and Articulation in Plate-making." Dr. A. M. Jackson, Macon: "A Contour Gold Inlay Without Investment." Dr. H. H. Johnson, Macon: "Some Ideas on Cast Fillings."

Kansas.—Dr. W. A. Coston, Topeka: "Porcelain." Dr. A. Lehrman, Kansas City: "A Method of Knowing If the Bite is Correct—Absolute." Dr. O. H. Simpson, Dodge City: "Helps in Prosthetic Dentistry." Dr. I. T. Hatfield, Marysville: "Cohesive Gold, Using Wet Process." Dr. F. B. Lawrence, Eldorado: "Preparation and Filling of Root-canal."

Kentucky.—Dr. H. B. Tileston, Louisville: "Hollow Gold Inlays."

Louisiana.—Dr. S. H. McAfee, New Orleans: "Removable Facing for Crown and Bridge Work."

Massachusetts.—Dr. Chas. E. Parkhurst, Somerville: "Gold Inlays and Splints for Loose Teeth." Dr. A. W. Doubleday, Boston: "Combination Inclined Plane and Retaining Appliance."

Missouri.—Dr. D. O. M. LeCron, St. Louis: "Cavity Preparation for Gold and Porcelain Inlays, Showing Plaster Models." Dr. F. Webster, Carthage: "Crown and Bridge Work." Dr. D. J. McMillen, Kansas City: "Bandless Metal Crown." Dr. D. D. Campbell, Ozark: "Contour Gold Inlay; 'Two Hours Saved.' " Dr. E. P. Dameron, St. Louis: "Use of Interchangeable Facings."

New York.—Dr. R. Ottolengui, New York: "Artificial Velum." Dr. V. H. Jackson, New York: "Orthodontia: Jackson System." Dr. M. C. Tracy, New York: "New Ideas in Porcelain Crowns." Dr. D. H. Young, Attica: "The Carbon System of Constructing Porcelain-face Crowns.". Dr. A. P. Burkhart, Buffalo: "Steele's Interchangeable Facings."

North Carolina.—Dr. C. W. Regan, Laurinburg: "Cast Fillings, Alexander Method." Dr. J. A. Gorman, Asheville: "Orthodontia." Dr. I. N. Carr, Durham: "Combination Filling of Tin and Gold." Dr. E. L. Hunter, Fayetteville: Subject to be selected.

Pennsylvania.—Dr. J. A. Libbey, Pittsburg: "Removable Saddle Bridge with Gold Inlay Abutment and Rubber Attachment." Dr. Ross Porter, Oil City: (1) "How to Grind a Drill and an Ordinary Hypodermic Needle for Use in High-pressure Obtunding Syringe that will Make Tight Contact with Tooth Easy." (2) "The Application of a Much-ignored Mechanical Principle in the Fitting of Artificial Dentures."

South Carolina.—Dr. A. P. Johnston, Anderson: "A New Method of Fitting Crowns and Making Inlays."

Texas.—Dr. R. W. Carroll, Beaumont: "An Original Method of Making a Porcelain-face Crown."

SURGICAL CLINIC.

Wisconsin.—Dr. B. G. Maercklein, Milwaukee: "Cleft Palate, Hare-lip, or Operation on Antrum."

A number of sources have not been heard from up to the present date, but it is confidently expected that by the time of the meeting the number of clinicians will be more than doubled.

Thos. P. Hinman, *Ch'm.*, Atlanta, Ga.
C. L. Alexander, *Sec'y*, Charlotte, N. C.

It is earnestly desired that there shall be a large attendance of members and delegates, so that the committee appointed to devise ways and means to own and control a dental journal may feel encouraged to launch such a scheme as will at once meet approval and hearty support, and the association have members enough to guarantee the project.

Many other features for a new era of success in the National Dental Association can be mapped out at the Atlanta meeting, if only we have a sufficiently large and enthusiastic gathering of the members of the profession to make it appear worth while.

Dr. S. W. Foster, Atlanta, Ga., has accepted the chairmanship of the Local Committee of Arrangements, in succession to the late Dr. J. A. Chapple.

M. F. Finley, *President*, Washington, D. C.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The twenty-fourth annual meeting of the National Association of Dental Examiners will be held at the New Kimball House, Atlanta, Ga., September 14th to 17th, commencing 10 A.M., Friday, September 14, 1906.

The rates per day will be, European plan, from $1.50 to $4.00; American plan, from $3.00 to $6.00, governed by choice of rooms.

The convention hall is in the hotel, and every effort will be made by the proprietors for the care and comfort of the members.

Arrangements are being perfected for those desiring a short ocean trip at reduced rates, via the Clyde and Old Dominion steamship lines, notice of which will be given by circular later.

Chas. A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The annual meeting of the National Association of Dental Faculties will be held in Atlanta, Ga., commencing at 2 p.m., Friday, September 14, 1906. The executive committee will meet at 10 a.m. on the same day.

H. B. Tileston, *Ch'man Ex. Committee*,
R. M. Sanger, *Sec'y Ex. Committee*,
East Orange, N. J.

DELTA SIGMA DELTA FRATERNITY.

The next annual meeting of the Supreme Chapter of the Delta Sigma Delta Fraternity will be held at the Piedmont Hotel, Atlanta, Ga., on Thursday, September 20, 1906.

Chas. R. Turner, *Supreme Scribe.*

INTERSTATE DENTAL FRATERNITY.

The annual meeting of the Interstate Dental Fraternity will be held at the New Kimball House, Atlanta, Ga., on Monday, September 17, 1906.

The meeting and banquet will be in charge of Dr. Thos. P. Hinman, the vice-president for Georgia. Dr. Hinman's well-established reputation as a host is a sufficient guarantee for a royal good time for all the fraternity who can arrange to be there. Do not miss it.

R. M. Sanger, *Nat'l Sec'y.*

CANADIAN DENTAL ASSOCIATION.

The Canadian Dental Association will hold its third bi-annual meeting in Montreal, Quebec, September 5 to 8, 1906.

Drs. S. H. Guilford and W. A. Capon, Philadelphia, and G. Lenox Curtis and F. L. Fossume, New York city, are among the outsiders contributing papers and clinics. A successful meeting is anticipated.

C. F. Morrison, *Sec'y*,
Montreal, Can.

AMERICAN SOCIETY OF ORTHODONTISTS.

The next meeting of the American Society of Orthodontists will be held in New York city during Christmas week, 1906.

Frederick S. McKay, *Sec'y*, St. Louis, Mo.

NORTHERN IOWA DENTAL SOCIETY.

The twelfth annual meeting of the Northern Iowa Dental Society will take place in Cedar Rapids, Iowa, September 11, 12, and 13, 1906.

C. N. Booth, *Sec'y*,
Cedar Rapids, Ia.

NORTHERN ILLINOIS DENTAL SOCIETY.

The Northern Illinois Dental Society will hold its nineteenth annual meeting at Aurora, Ill., October 17 and 18, 1906. All dentists of the district are urged to attend; a good program is assured.

A. M. Harrison, *Sec'y*,
Rockford, Ill.

NORTHERN INDIANA DENTAL SOCIETY.

The eighteenth annual meeting of the Northern Indiana Dental Society will be held in Hammond, Ind., September 18 and 19, 1906.

Arrangements are being made to make this the greatest convention ever held in northern Indiana. Already some of the best talent in the country has been secured.

Samuel A. Bell, *Sec'y*,
Hammond Bldg., Hammond, Ind.

ST. LOUIS DENTAL SOCIETY.

Golden Jubilee.

The St. Louis Dental Society, the oldest continuous dental organization in the world, will celebrate its golden anniversary with a banquet and entertainment some time in November, when the fiftieth year of its existence will be completed. Eminent men in the profession outside of the city and state will participate.

More detailed announcement will be given in October issue.

J. B. Newby, *Ch'man Com. Arrangements.*
W. F. Lawrenz, *Sec'y.*

NORTHEASTERN DENTAL ASSOCIATION.

THE twelfth annual meeting of the Northeastern Dental Association will be held in Horticultural Hall, Boston, Mass., October 17, 18, and 19, 1906.

This meeting—held in Boston—can and will be made a great success. The talent for both essays and clinics is of a very high order, and plenty of it. The exhibits also promise to be elaborate and interesting. Please remember the dates. An invitation is extended to all ethical members of the profession to attend.

EDGAR O. KINSMAN, *Sec'y*,
Cambridge, Mass.

HARVARD DENTAL ALUMNI ASSOCIATION.

AT the thirty-fifth annual meeting of the Harvard Dental Alumni Association, held in Boston, Mass., June 25, 1906, the following named officers were elected for the ensuing year: Arthur W. Eldred, '90, Worcester, Mass., president; Harvey W. Hardy, '96, Boston, Mass., vice-president; Waldo E. Boardman, '86, Boston, Mass., secretary; Harold DeWitt Cross, '96, Nashua, N. H., treasurer.

Executive Committee—Waldo E. Boardman, '86 (*ex-officio* chairman—one year), Boston, Mass.; Arthur A. Libby, '99 (one year), Boston, Mass., and William W. Marvel, '00 (two years), Fall River, Mass.

The Council is composed of the officers of the association.

Trustees Life Membership Fund—Harold DeW. Cross, '96 (one year), Nashua, N. H.; Frederick Bradley, '86 (two years), Newport, R. I.; Joseph T. Paul, '91 (three years), Boston, Mass.

WALDO E. BOARDMAN, *Sec'y*,
Boston, Mass.

SOUTH CAROLINA STATE DENTAL ASSOCIATION.

THE thirty-sixth annual meeting of the South Carolina State Dental Association closed Friday, June 29, 1906.

The meeting was a pronounced success in every respect, and the Isle of Palms proved to be an ideal place for the meeting. We also appreciate and thank the dentists of Charleston for their unbounded hospitality.

The following officers were elected for next year: J. H. E. Milhous, Blockville, president; T. T. Moore, Columbia, first vice-president; E. J. Etheridge, Leesville, second vice-president; E. N. Kibler, Prosperity, corresponding secretary; R. Atmar Smith, Charleston, recording secretary; W. S. Brown, Charleston, treasurer.

The association will meet next year in Anderson, S. C., where we expect a very successful meeting, the time of meeting to be announced later.

EUSTON N. KIBLER, *Cor. Sec'y*,
Prosperity, S. C.

MICHIGAN STATE DENTAL ASSOCIATION.

THE semi-annual convention of the Michigan State Dental Association was held at Detroit, Mich., July 9 to 11, 1906.

The following officers were elected for the ensuing year: A. L. LeGro, Three Rivers, president; E. B. Spalding, Detroit, vice-president; L. N Hogarth, Detroit, secretary; Ward House, Grand Rapids, treasurer; George Zederbaum, Charlotte, to fill vacancy on board of trustees.

L. N. HOGARTH, *Sec'y*,
Detroit, Mich.

MINNESOTA BOARD OF EXAMINERS.

THE Minnesota State Board of Dental Examiners will hold their regular meeting on October 2, 3, and 4, 1906, at the dental depot of the state university in Minneapolis. All applications must be in by noon of October 2d. Any further information will be furnished by

GEO. S. TODD, *Sec'y*,
Lake City, Minn.

CONNECTICUT DENTAL COMMISSIONERS.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Wednesday, Thursday, and Friday, November 7, 8, and 9, 1906, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before said meeting.

All applicants should apply to the recorder for proper blanks and the rules for conducting the examination. Application blanks must be filled in and sworn to, and, with fee, filed with the recorder on or before November 1, 1906. By order of the Commission.

GILBERT M. GRISWOLD, *Recorder*,
783 Main st., Hartford, Conn.

IDAHO BOARD OF DENTAL EXAMINERS.

THE Idaho Board of Dental Examiners meets in Boisé City, December 27, 28, and 29, 1906, for the purpose of examining applicants for license to practice dentistry in Idaho.

C. E. M. LOUX, *Sec'y*,
Pocatello, Idaho.

RHODE ISLAND BOARD OF REGISTRATION.

THE semi-annual meeting of the Rhode Island State Board of Registration in Dentistry, for the examination of candidates, will be held at the State-house, Providence, November 6, 7, and 8, 1906. Applications, together with the fee of twenty dollars, if first examination, should be in the hands of the secretary not later than November 1st.

W. S. KENYON, *Sec'y*,
301 Westminster st., Providence, R. I.

ARMY DENTAL CORPS.

[*Army and Navy Journal.*]

CONTRACT Dental Surg. J. R. Bernheim, now on duty at Plattsburg Barracks, N. Y., will proceed on or about May 1, 1906, to Fort Wadsworth, N. Y., for temporary duty for a period of not more than two and one-half months. (April 20, D. E.)

Dental Surg. George E. Stallman will proceed to Camp Connell, Samar, for duty thereat. (May 16, D. V.)

Dental Surg. Emmett J. Craig will proceed to Camp Stotsenburg, Pampanga, for duty. (May 23, D. Luzon.)

Dental Surg. George E. Stallman will proceed to Camp Bumpus, Leyte, for duty. (June 1, D. V.)

Dental Surg. Ralph W. Waddell will proceed from Parang to Malabang, Mindanao, about June 15, 1906, for duty. (June 7, D. Min.)

Dental Surg. F. Homer Wolven will proceed about June 20, 1906, with his outfit and enlisted assistants, to Fort H. G. Wright, N. Y., for temporary duty at the posts in that district where his services may be needed, for a period of not more than two months. (June 19, D. E.)

Dental Surg. Douglas E. Foster, now at Oklahoma City, will proceed to San Francisco, Cal., and take transport to sail from the latter place on or about July 25, 1906, for Manila, for duty. (July 6, W. D.)

Dental Surg. John D. Milliken, Fort Leavenworth, will proceed about July 23, 1906, to the camp of instruction, Fort Riley Reservation, Kans., for duty. (July 9, D. Mo.)

Dental Surg. Rex H. Rhodes, Fort Sheridan, Ill., will proceed to Columbus Barracks, Ohio, for duty. (July 9, D. Lakes.)

Leave for three months, with permission to return to the U. S. by way of Europe, is granted Dental Surg. Edwin P. Tignor, when relieved from further duty in the Philippines. (July 19, W. D.)

So much of S. O. No. 75, c.s., these headquarters, as directs Contract Dental Surg. J. C. Whinnery and assistant to proceed to Fort Liscum, Alaska, is revoked. (July 26, D. Col.)

Dental Surg. William G. Hammond, having reported arrival at San Francisco, will proceed to Fort Logan, Colo., for duty, relieving Dental Surg. William H. Ware, who will proceed to San Francisco, and take first available transport for Manila and report to commanding general, Philippines Division, for duty. (July 31, W. D.)

COMMITTEE ON DENTAL HISTORY, N. D. A.

AT the Buffalo meeting of the National Dental Association, the Committee on History of Dentistry reported to the association that Dr. Vincenzo Guerini of Naples, Italy, had written a History of Dentistry from the earliest times down to the beginning of the nineteenth century, which work is in the hands of the committee, having been translated into English and fully revised and edited. Dr. Guerini has generously placed the publication of this great work under the patronage of the National Dental Association in token of his appreciation of American dental development. In order that the work may be published without financial loss it is necessary that about 700 subscriptions for copies at $5.00 each be obtained before contracts for printing, binding, and publishing the work can be entered into, and the duty of securing these advance subscriptions has been assigned to the Committee on History of Dentistry of the National Dental Association.

* * * * *

It is the desire of the committee having this matter in charge to secure as promptly as possible the subscriptions necessary before the work can be published. We ask you to consider this as a personal appeal to forward your subscription for the work to Dr. Charles S. Butler, The Frontenac, Buffalo, N. Y., who, with the treasurer of the National Dental Association, Dr. V. E. Turner, Raleigh, N. C., will act as custodian of the publication fund.

Announcement will be from time to time made in the dental journals of the growth of the subscription list and the progress of the work of publication. The sooner the required 700 names are obtained, the sooner the work can be issued. The volume, it is estimated, will comprise about 500 pages. It will be profusely illustrated, and bound in cloth.

In case this proposed publication meets with the success which it merits, a second and companion volume, treating of the more modern aspect of dentistry, will probably be issued under the same auspices and conditions.

Edward C. Kirk, Philadelphia.
Wm. H. Trueman, Philadelphia.
Gordon White, Nashville, Tenn.
H. L. Ambler, Cleveland, Ohio.
Jas. McManus, Hartford, Conn.
J. Y. Crawford, Nashville, Tenn.
A. H. Fuller, St. Louis, Mo.
S. A. Freeman, Buffalo, N. Y.
W. E. Boardman, Boston, Mass.
Charles S. Butler, Buffalo, N. Y.

Burton Lee Thorpe, *Sec'y*, St. Louis, Mo.
Chas. McManus, *Ch'man*, Hartford, Conn.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JULY 1906.

July 3.

No. 825,271, to Geo. N. Guthrie, Right-angle bur-mandrel.

July 10.

No. 825,356, to Wm. B. Short. Artificial tooth for crown and bridges.

No. 825,578, to Arthur W. Browne. Tooth-shade guide.

July 17.

No. 825,891, to Arthur W. Browne. Dental engine.

No. 825,896, to Francis X. Dusseau and Bernard F. Kirk. Dental measuring tool.

No. 825,901, to Edmund D. Gilbert. Vulcanizer.

No. 825,940, to Henry H. Schuhman. Crown tooth attachment.

July 24.

No. 826,629, to John V. Trenaman. Cord suspension electric dental engine.

No. 826,818, to James H. Abbott. Dental tool.

No. 826,977, to George J. Weber. Dental swaging device.

July 31.

No. 827,121, to Patrick F. Roach. Tooth-cleaning device.

No. 827,228, to Phelps M. Freer. Cuspidor or spittoon.

No. 827,308, to David M. Hitch. Tooth-brush holder and sterilizer.

No. 827,507, to Lyter H. Crawford. Dental instrument.

No. 827,508, to Lyter H. Crawford. Dental swaging apparatus.

DR. O. N. HEISE.

THE

DENTAL COSMOS.

VOL. XLVIII. OCTOBER 1906. No. 10.

ORIGINAL COMMUNICATIONS.

PIONEER DENTISTRY IN NEW YORK: AN HISTORICAL STUDY.

By EDWARD C. KIRK, D.D.S., Sc.D., Philadelphia, Pa.

(Read before the Dental Society of the State of New York, at its annual meeting, Albany, N. Y., May 11, 1906.)

THE study of individual character may have a variety of purposes. It may be taken up as a pastime from motives of curiosity, or its ends may be utilitarian or scientific. The usefulness of character study is at once manifest when we consider how constantly it is brought into requisition in determining the fitness of individuals for positions of trust or of those demanding skill and intelligence. In choosing a corporation officer, a business associate, even an errand-boy, or sometimes even a matrimonial partner, it is customary to learn something of the individual's character and the forces hereditary, educational, and environmental which were concerned in its making, before closing the contract or agreement. It is upon the data obtained from such a character study that we endeavor to prognosticate something of the future behavior and efficiency of the individual under consideration. This is considered to be only the manifestation of ordinary prudence, tending to avoid business calamities on the one hand, and the divorce courts on the other. This kind of character study distinctly includes the past history of the individual, for it is the data of his history which usually indicate most clearly his trend of activity or his tendencies, and it is in the light of his tendencies that we are enabled with the greatest accuracy to determine the character and direction of his future.

What is true of the individual is equally true of groups of individuals—the family, the clan or tribe, the municipality, the commonwealth, the nation. The more closely the group of individuals is united by common interests, the more clearly does the analogy between the character development of the individual and that of the group or class manifest itself. We are accustomed to speak of the professional body, the whole body of the profession or the character of the dental profession as compared with that of other professions, implying by these and similar expressions that there is in our minds a concept of our whole craft which makes us regard it as a unit, as an individual having certain characteristics, and we so regard it because as a matter of fact there are characteristic factors common to all the individual units that go to make up our professional body. We regard, then, our profession as a *thing* in much the same sense that we regard our republic as a thing. It has a character, it had its birth, it has grown, and it will continue to grow and develop.

As it is profitable, even necessary, for us to study the past history of the individual in estimating his character and prognosticating his future progress, especially in connection with questions of responsibility and trust, so also is it profitable, indeed it is indispensable, that we should know the history of our profession if we would have an intelligent understanding of its character and possibilities; for dentistry holds even now a position of public trust in that it is charged in its degree with the care of the public health, and the faithfulness with which it multiplies the talents committed to its care will determine its status for the future.

These considerations are my justification for asking your attention to some matters connected with the early history of your own state. I am still further impelled to discuss this question with you because in my studies of American dental history it has been a growing conviction that the part played by the Empire State in the development of American dentistry has not been given that degree of prominence to which it is justly entitled; and while I can only hope at this time to very briefly refer to some of the earlier historical incidents connected with New York dentistry, I hope I may be able to arouse an interest in the subject which will stimulate others, and especially some of your own number, to seriously investigate the subject, so that ultimately we may be in possession of a fairly complete record of the history of dentistry in New York. I may say here frankly that this last is my principal object in the presentation of this paper at this time.

THE WOOFFENDALES.

It is not by any means clear who first began the practice of dentistry in New York. In the "History of Dental and Oral Science in America" it is stated that—

> In October of the year 1766 there arrived in the United States from England Mr. JOHN [*sic*] WOOFFENDALE. This gentleman was (for that time) a regularly educated dentist, having been instructed by Mr. Thomas Berdmore, dentist to George III. He is the first dentist so called and practicing as such of whom any record can be found as having visited this country. Mr. Wooffendale commenced practice in New York soon after he arrived. He also practiced in Philadelphia. But, either because he did not receive sufficient practical encouragement in his profession or from some other unexplained cause, he returned to England in March 1768. While here he constructed an entire double set of artificial teeth for Mr. William Walton of New York, which is believed to be the first recorded full set of teeth inserted in America. From the time when Mr. Wooffendale returned to England until some years after the Declaration of Independence there was not, as far as can be discovered, a regularly practicing dentist in this country.

The author of the foregoing statements seems to have had the unfortunate tendency of drawing upon his imagination for his data;—a method which in poetry or fiction may be exhibited to the best advantage, but which in historical writing is inexcusable.

Wooffendale was not the first to proclaim himself a dentist in New York; second, his name was not John; third, though he did return to England he did not remain there permanently; fourth, there were a number of other practicing dentists in the country all through the revolutionary period.

In the *New York Weekly Journal,* January 6, 1735, appears the following notice:

> TEETH drawn and old broken Stumps taken out very safely and with much care by JAMES MILLS, who was instructed in that art by the late James Reading, deceased, so fam'd for drawing teeth. He is to be spoke with at his shop in the house of the deceased near the Old Slip Market.

In 1766 JAMES DANIEL of New York, a wig-maker and hair-dresser, advertises that he also operates on the teeth—"a business so absolutely necessary in this city." The same year,

> ROBERT WOOFFENDALE, *Surgeon Dentist*, lately arrived from London,

advertises that—

> Having received instructions from the present operator for the King's teeth, performs all operations upon the teeth, gums, sockets, and palate; also fixes artificial teeth so as to escape discerning.

In September 1767 Wooffendale married Martha Stevenson and removed to Jamaica, Long Island, but announces in the *Post-Boy* of January 1768 that he would visit New York on Thursdays. His wife died at Jamaica, December 13, 1808, aged sixty-six, and he died twenty years later, in the summer of 1828, leaving by will (N. Y. Lib. 62, p. 361) to his son John his dental instruments and the case containing them. A second son, Robert, was of Dayton, Ohio. A daughter, Ann, died March 14, 1801, aged twenty-five; the others who survived him were Martha of New York, who long conducted a young ladies' seminary; Mary Eaken, of New York; and Elizabeth, of Ramsgate, England.

JOHN WOOFFENDALE (son of Robert), Surgeon Dentist, of New York, was married in January 1807, by Bishop Moore to Catherine Castelli, daughter of an Italian staymaker who arrived in New York from Paris early in 1792. Wooffendale removed about May 1807, from No. 84 Broadway to No. 27 Partition (Fulton) st., opposite the lower corner of St. Paul's Churchyard. John Greenwood was then on the other side of the Churchyard, at No. 14 (now 20) Vesey st. In 1808 Wooffendale was at No. 2 Courtlandt street, the corner of Broadway, and remained there some years. He was still practicing in New York in 1850.

For these data and much of that which follows I am indebted to Mr. Isaac J. Greenwood of New York, a grandson of John Greenwood to be mentioned later, well known as the dentist of George Washington.

It will be seen, then, that the practice of the Wooffendales originated with the father in New York in 1766, and was continued by the son well down to the middle of the last century, if not later. When the son began dental practice I have been unable to ascertain. His father, Robert Wooffendale, remained in England from 1768 until 1795, when he returned to the United States and resumed practice in New York, where he continued for about two years, when he retired with his family to his Long Island farm, leaving his professional business in charge of his son John. He died October 3, 1828, in the eighty-seventh year of his age. (*Harris' Dictionary of Dental Science,* 1849, p. 777.)

JOHN BAKER.

Another important figure in the early development of American dentistry was JOHN BAKER, whose advertisement appears in Boston as early as 1767. In the *Massachusetts Gazette and Boston News-Letter* of Thursday, January 29, 1767, we find the following:

> JOHN BAKER, *Surgeon Dentist,*—Begs leave to take this method of informing the Publick: That he leaves this Place in Twenty Days at Farthest: That those who are disposed to apply to him may not be disappointed. He also begs leave to express his Gratitude for the Favors he has received while in Boston, and hopes that those who doubted the Safety of his Art from its Novelty in this Country are now convinced of its Safety and Usefulness. Until he leaves this Town he continues at Mr. Joshua Brackett's in School Street, where he will be ready to contribute to the utmost of his Power to serve the Publick in his Profession. His Dentifrice,

> with proper directions for preserving the Teeth and Gums, will be had at Mrs. Eustis's near the Town House, after he has left the Town. N. B.—Each Pot is sealed with his Coat of Arms, as in the margin of Directions, to prevent Fraud.

On April 10th, some ten weeks later, he again announces his intention of leaving Boston in ten days, returns thanks to the public for their patronage, and announces his intention of returning for a subsequent visit. This same advertisement appeared for the last time in Boston in the issue of the *Gazette and News-Letter* for April 30, 1767. On May 9, 1768, his advertisement appears in the *New York Weekly Journal* as follows:

> John Baker, *Surgeon Dentist,*—Begs leave to acquaint the gentry of New York City that he has given proof of his superior art to the principal nobility, gentry, and others of Great Britain, France, Ireland, and other principal places of Europe; also to 2000 persons in Boston, and is now in this city at Mr. John Watson's, in the house where Capt. Randall lately lived, on the corner of Pearl Street, where he fills teeth with lead or gold, and makes artificial teeth, and fixes them with fine gold, so that they will remain fast for many years, and persons may eat, drink, and sleep with them in their mouths as natural ones, from which they cannot be distinguished by the sharpest eye.

In the *Journal* of July 21st he announces his departure in ten days and concludes—

> Each pot [of his dentifrice] is sealed with his Coat of Arms, as in the margin of Directions, to prevent Fraud.

Baker and Robert Wooffendale were contemporaneous. If the date of arrival of the latter as given in the "History of Dental and Oral Science in America" may be regarded as correct, viz, October 1766, then there elapsed but a few months until the advertisement of John Baker appeared in the Boston paper for January 29, 1767. Like many others of his class and time, Baker was an itinerant. That he practiced both in Boston and New York is definitely known, and Watson, in his "Annals of Philadelphia," states (vol. i, p. 179) that when Joseph Lemaire first landed in Philadelphia in 1784 he found there a dentist by the name of Baker, who, he states, was "the first person ever known as a dentist in Philadelphia," and it is quite within the limits of probability that he was the same John Baker of Boston and New York.

In Francis White's Philadelphia Directory for 1785, the first directory of Philadelphia published, the name of Dr. John Baker, dentist, appears, and his location is given as on Second st. between Walnut and Spruce. The same directory gives the name of Gardette, he and Baker being the only dentists mentioned. In the advertisement announcing the canvass for the directory it is stated that it will give only the names of permanent residents. It is doubtless from this source that Watson derived his information, and upon which he made the statement afterward quoted in the "History of Dental and Oral Science in America," by Dexter.

Watson is probably in error as to Baker having been the first person known as a dentist in Philadelphia, as several others were known there previous to the advent of Lemaire, among others Michael Poree, who advertised in the *Pennsylvania Gazette* of July 6, 1771, as a Surgeon Dentist "just arrived from New York."

The career of John Baker is of interest and importance, because it was from him that Paul Revere, the versatile Boston patriot, derived his knowledge of dental art, and it is highly probable that from the same source Isaac Greenwood, the ivory-turner of Boston, also derived his dental knowledge, and thus laid the foundations of an influence exerted through his sons and grandsons which had much to do with the early development of our art in New York and elsewhere—an influence well established before the advent of French dentistry into the Colonies through Lemaire and Gardette.

Before considering at greater length the Greenwood relationship to New York dentistry, it may be well to note several names which appear in advertisements before and during the revolutionary period.

POREE—HAMILTON—DUBUKE—FISHER—DUSTWIGE.

In 1769,

MICH'L POREE, *Surgeon Dentist,*

advertises to—

> fix natural and artificial teeth, from a single one to a whole set, to appear as well and be as useful and easy as real teeth. He likewise cleanses the teeth and draws stumps, and lodges at Mrs. Cornwall's, two doors from the back of the old City Hall.

In July 1771 he was advertising in Philadelphia, as already noted. In October 1772 he was back in New York, "opposite the Bowling Green," and the next year in Boston.

In June 1769 a long advertisement of Mr. **HAMILTON,** Surgeon Dentist, from London, appears in the *New York Chronicle.* He was located "at Mrs. Buskirk's, corner of Wall st. near the Coffee-house." On August 17th of the same year he again advertises in the *Chronicle* at Capt. Joseph Goldthwaite's in Back st., and recommends his "tincture," with which

> The most violent toothache is cured in a few minutes without drawing. No cure, No pay.

A Frenchman, Dr. **DUBUKE,** advertises himself in the *Constitutional Gazette,* New York, December 20, 1775, as just arrived from Boston. He was staying "at Mrs. Livingston's opposite the Queen Charlotte Tavern in Dock Street." The next month he was branded for stealing indigo. He had traveled through the eastern colonies under various names, but now left for Philadelphia and the southern colonies.

The next year, 1776, the *Constitutional Gazette* mentions **LEONARD FISHER,** Surgeon-Barber and Dentist, Charham Row, opposite St. Paul's Church. He was in 1790 at 114 Queen (Pearl) st. and in 1798 advertises as Surgeon Dentist at 451 Pearl st.

In *Gaine's Gazette* of June 9, 1777, appears the advertisement of **RICHARD DUFORT DUSTWIGE,** surgeon from Europe, midwife, oculist, and dentist, who makes artificial teeth "which perfectly resemble the natural," etc., and who resides in Duke st. (in the house formerly of Isaac Kip). The following March when at 13 Duke st. he announces his sailing next month for Europe. But in 1780, in *Rivington's Royal Gazette,* Dr. Dastuge, probably the same man, advertises, at 276 Broad st., that he had studied in the schools of Paris, and that he operates on the teeth and constructs artificial ones, etc. In the same paper for August 1782, a party at 28 Maiden Lane advertises for "front teeth" at four guineas each as follows:

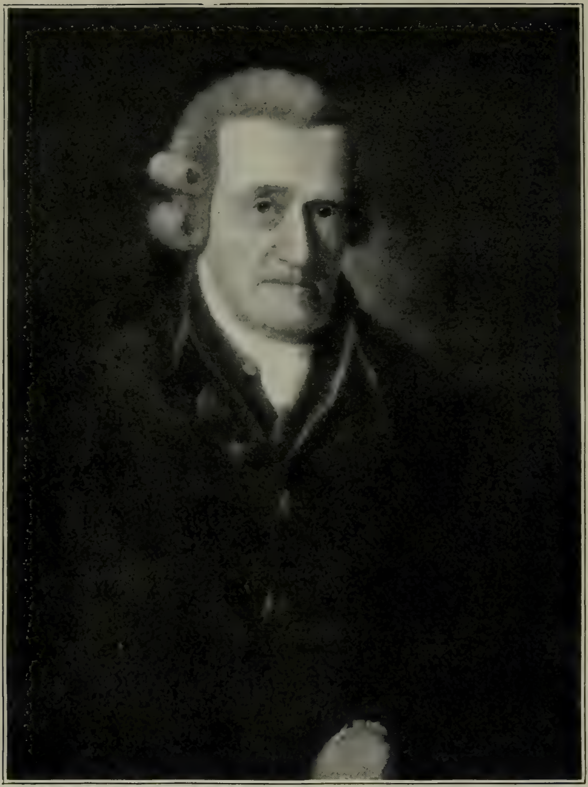
> **TEETH.**—Any person that is willing to dispose of his Front Teeth may hear of a purchaser by applying to No. 28 Maiden Lane; for which a generous price will be given. N. B.—Four Guineas will be given for every Tooth.

This liberal offer appears to have had the effect of producing an over-supply, with a consequent bearish tendency in the front-tooth market, for in the *Independent Journal* of January 1784 he reduces his offer to two guineas each tooth. The demand for sound human teeth for the replacement of dental losses seems to have been rather a steady one, for in the *Daily Advertiser* of November 23, 1787, in the advertisement "Live Teeth Wanted," one guinea apiece is offered.

THE GREENWOODS—LEMAIRE, ETC.

During the revolutionary period the city of New York was occupied by the British, but soon after the evacuation in November 1783, **ISAAC GREENWOOD,** Jr., son of Isaac Greenwood, ivory-turner, dentist, etc., of Boston, came to New York, and in *Rivington's Gazette* of December 24th and the *Independent Journal* of January 7, 1784, he advertises as a dentist at Mrs. Richardson's house, No. 24 Old Slip. His advertisement is an interesting document, and is as follows:

> **MR. GREENWOOD,** *Surgeon Dentist* (lately arrived in this city),—Begs leave to acquaint the publick that he preserves the



—*From an oil portrait.*

ISAAC GREENWOOD OF BOSTON.

FATHER OF JOHN GREENWOOD.

Teeth and Gums by removing an infectious Tartar, that destroys them and renders the natural purity of the breath offensive. He cures the Scurvy in the Gums; also fastens the teeth by causing the gums to grow up and adhere to them. He extracts and replaces the Teeth, regulates, gives them proper vacancies, cleanses the Teeth, and makes them white. He substitutes Artificial Teeth in so neat a manner as not to be perceived from natural ones, without drawing the stumps or causing the least pain. They give a youthful air to the countenance, and render pronunciation more agreeable and distinct; in a word, both Natural and Artificial are of much real service—it is a folly to neglect them. And as he would ever have his work recommend him, he requires no pay from those that are not completely satisfied with his performances. He has Pills for the Tooth Ache, that seldom fail to give relief; likewise boxes of Teeth Powder and Brushes that will recommend themselves. N. B.—Mr. Greenwood will with pleasure attend those Ladies and Gentlemen who cannot conveniently wait on him at his rooms in Mrs. Richardson's house, No. 24 at the Old Slip in New York.

In the spring of 1785 he left the city for Charleston, S. C., but was soon discouraged and returned north, to Providence, R. I., whence in 1810 he removed and again settled in New York, succeeding his brother Clark as a mathematical instrument maker.

In May 1785 Dr. Le Mayeur, Dentist, No. 49 Wall st., advertises that he puts in natural teeth with or without stumps—"a method never practiced in Europe or America, and discovered only four months ago." He offers two guineas for front teeth. Previous to this, Lemaire (as he also spelled his name) had been in Philadelphia, and seems to have practiced as an itinerant, for in November 1786 he again announces his recent arrival in New York, and that he can be found at his lodgings No. 30 Broad st., corner of Princess st., and that he "intends leaving town at the beginning of this [*sic*] week."

December 15, 1786, Dr. HORNBY, Dentist, advertises from No. 66 Cherry st., that he had been in practice for over twenty years, and had been all over Great Britain, Holland, Germany, the West Indies, and most towns on this continent, "Extracting Teeth One Dollar each." "Operates, extracts, transplants; makes and fixes Artificial Teeth."

In the first New York Directory, 1786, occurs the name of J. BROWN, Surgeon and Dentist of Little Queen (Cedar) st.

Meanwhile JOHN GREENWOOD, a native of Boston, Mass., born in the year 1760, who had come to New York soon after the arrival of his brother Isaac already referred to, had been gradually perfecting himself in the profession of his father. He began practice and issued a handbill in 1785, and in the *Daily Advertiser* of February 28, 1786, appears what is probably his first newspaper advertisement:

> *WHITE TEETH—A Great Ornament.*
>
> JOHN GREENWOOD, *Dentist*, No. 199 Water Street,—Encouraged by the success of his practice, begs leave to acquaint the publick that he preserves the Teeth and Gums by removing an infectious Tartar, [etc.].

No. 199 Water st. was opposite Cornelius Bradford's Coffee-house (No. 200), famous among the Liberty Boys. The Directory of 1786 gives the name of J. Quincy, instrument-maker, at 199 Water st. Greenwood lived with him for a time. In November and December 1786 he advertised as from 21 John st., but in May 1787 he removed back to 199 Water st., and describes his location as "opposite the Coffee-house."

John Greenwood, when in 1786 he reached New York, was a young sea captain who had seen considerable service through the late war as a privateersman.* He was skilled in carving and turning, his father's mechanical business in Boston, and had acquired some idea of dentistry, as then practiced, during the brief intervals of his returns home. He made one trip to the West Indies and two to Charleston, S. C., but failed to find sufficient employment at sea, and the little he did at turning and the tinkering of nautical instruments not as yet proving very remunerative, he turned his whole attention to the profession of dentistry. After a while he sent for two of his brothers, and the Directory of 1789 mentions Clark Greenwood, mathematical instrument-maker, 199 Water st., who conducted that business until his decease in 1810.

The youngest brother, WILLIAM PITT GREENWOOD, assisted professionally in the dental office, but soon returned east, and in 1790 was practicing in Salem and the next year in Boston. In the *Boston Mercury* of January 6, 1797, W. P. Greenwood announced that he "continues with his dental profession the sale of piano-fortes and guitars." He removed to Roxbury in 1832. The degree D.D.S. was conferred honorarily upon W. P. Greenwood on February 18, 1842, by the Baltimore College of Dental Surgery at its second annual commencement. He continued in practice for many years, and died on the eighty-fifth anniversary of his birth, May 10, 1851. His youngest son, Edwin L. Greenwood, was a practitioner in Boston, as was also his grandson (Alfred, son of the Rev. Alfred Greenwood), likewise his nephew, Dr. Henry Gay, who practiced in Providence, R. I., and was noted for his construction of artificial palates. While William Pitt Greenwood was not strictly

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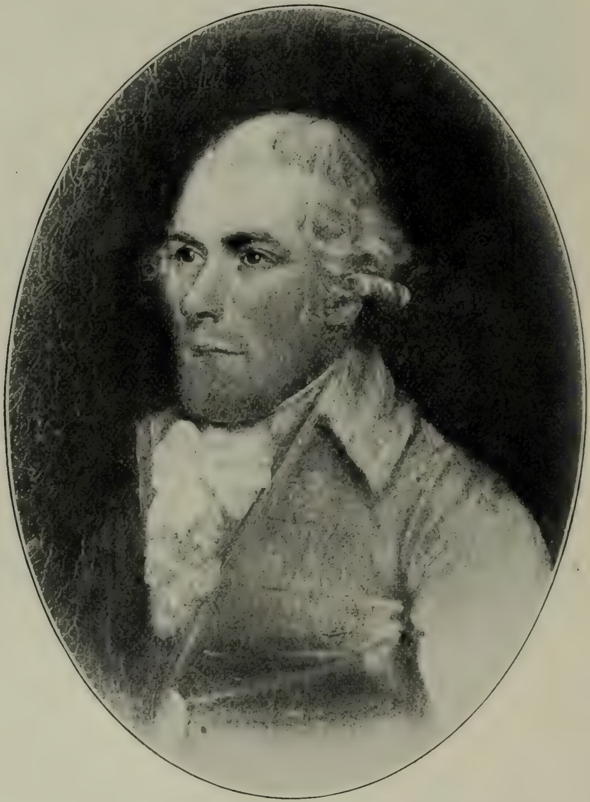
**Vide* "Memoirs of the Life of the Late Mr. John Greenwood," compiled by E. Bryan, *American Journal of Dental Science*, vol. i, 1839, p. 73 *et seq.*

a New York practitioner, nor were either of his descendants just alluded to, the foregoing details are of interest as evidence of the pronounced influence of the Greenwood family upon early American dentistry, the principal source of its activity arising from John Greenwood of New York.



—*From an oil portrait.*

John Greenwood

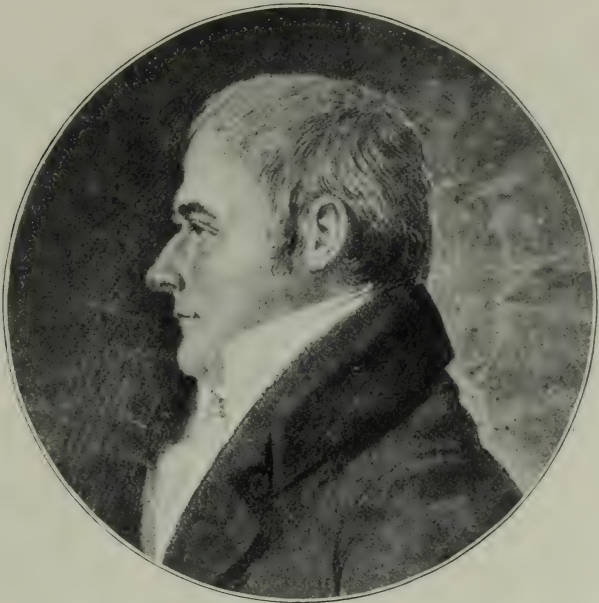
DENTIST TO GEORGE WASHINGTON.

About a month after President Washington reached New York the following advertisement of John Greenwood appeared in the *New York Packet* of May 21, 1789, inserted sidewise so as to attract attention:

THE DENTIST is Removed
From No. 19 to No. 56 William Street.

GARDETTE—SKINNER.

In August 1789 JAMES GARDETTE was located in New York at No. 22 Beekman st. when John Greenwood was at No. 56 William st., corner of Beekman, where he resided until 1791. Gardette, a Frenchman, having passed the examination by the surgeons of the Admiralty at Bayonne, France, received his commission as a surgeon in the French navy, and in October 1777 embarked in his professional capacity on the brig-of-war "La Barquaize de St. Jean de Luz," destined for Boston, Mass., and arrived at Plymouth early in January of 1778. He had received instruction in dentistry from M. Le Roy de la Faudiniere, a practitioner of Paris then in high repute, and when the French fleet and army arrived at Newport he was induced to visit that town and commence practice as a dentist, the officers affording him considerable occupation. He returned to Boston from Newport, and in the autumn of 1783 went to New York, and was there when the American army under General Knox took possession of the city. In 1784 he went to Philadelphia, and in that city took the oath of allegiance October 11, 1785. Gardette remained in New York but a short time. President Washington gave his patronage to both Gardette and Greenwood. When in the winter of 1795-96 sittings were given to Stuart for a second effort by that artist, Washington was wearing a set of teeth recently fabricated by Gardette, and the result was the bulging upper lip which is so prominent a feature in that portrait. Peale says, "In the first sittings of September 1795 to Stuart and myself, Washington wore a set made by John Greenwood," and states that the Philadelphia set materially altered the appearance of the mouth and was soon discarded.



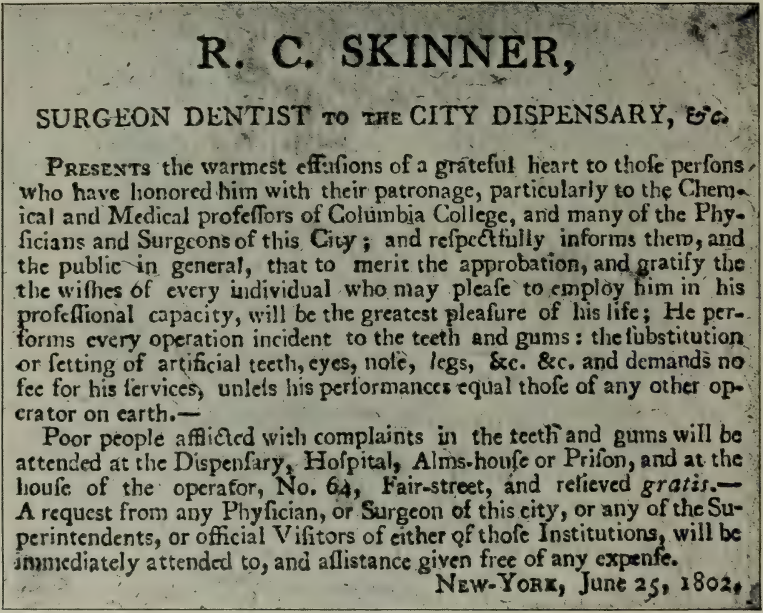
—*From the drawing by Roy of Paris.*

JOHN GREENWOOD (*circa* 1805).

[From the original of this portrait was made the engraving which appears at page 73, vol. i (1839), of the *American Journal of Dental Science.*]

In the New York papers of 1791, Mr. R. C. SKINNER advertises from his rooms at 27 John st., opposite the Play-house, as "a pupil of one of the most eminent practitioners of that profession in London." In 1792 he occupied the quarters at 56 William st. from which John Greenwood had removed, and was the following year located at 47 Nassau st., next to the Dispensary. He states that he would "give one guinea each for live front teeth, and a generous price for any quantity of dead front teeth," also that he supplies artificial eyes. In September 1802 he was married at Hartford, Conn., by Rev. Mr. Flint to Miss Mary Whiteman of the same place. He was probably a relative of Dr. John Skinner, dentist, of New Haven, living in 1795.*

One of his advertisements appearing at this time and later is as follows:



R. C. SKINNER,

SURGEON DENTIST TO THE CITY DISPENSARY, &c.

PRESENTS the warmest effuſions of a grateful heart to thoſe perſons who have honored him with their patronage, particularly to the Chemical and Medical profeſſors of Columbia College, and many of the Phyſicians and Surgeons of this City; and reſpectfully informs them, and the public in general, that to merit the approbation, and gratify the the wiſhes of every individual who may pleaſe to employ him in his profeſſional capacity, will be the greateſt pleaſure of his life; He performs every operation incident to the teeth and gums: the ſubſtitution or ſetting of artificial teeth, eyes, noſe, legs, &c. &c. and demands no fee for his ſervices, unleſs his performances equal thoſe of any other operator on earth.—

Poor people afflicted with complaints in the teeth and gums will be attended at the Diſpenſary, Hoſpital, Alms-houſe or Priſon, and at the houſe of the operator, No. 64, Fair-street, and relieved *gratis*.—A request from any Phyſician, or Surgeon of this city, or any of the Superintendents, or official Viſitors of either of thoſe Institutions, will be immediately attended to, and aſſiſtance given free of any expenſe.

NEW-YORK, June 25, 1802.

Even in those early days professional *esprit de corps* was not always a guarantee against unpleasant comments upon individual methods of practice and the consequent bitterness of feeling which criticisms of this kind are prone to engender. It appears that one of Skinner's patients subsequently fell into the hands of Gardette, and the strictures which he uttered upon the nature of the work and the character of the operator, together with the use of the term "a wheelbarrow," which he used in a contemptuous way of Mr. Skinner, so aroused the latter that he instituted a suit for slander against Gardette, the whole issue in the case turning upon the "wheelbarrow" incident.

GREENWOOD ADVERTISEMENTS.

About July 1791 Mr. Greenwood removed to No. 5 Vesey st. In the *New York Weekly Museum* of July 28th and for some time thereafter the following advertisement, including his fee bill, appears:

> JOHN GREENWOOD, *Surgeon Dentist and Operator for the Teeth,*—Has removed to No. 5 Vesey Street, side of St. Paul's Church. Whose abilities are universally approved by seven years successful practice in this city. He transplants, makes and cleans the teeth as usual. Price as follows:
>
> Transplants teeth—3 guineas each.
> Grafts natural teeth—3 dollars each.
> Makes and fixes artificial teeth—8 to 20s. each.
> Cleans the teeth—from 8 to 20s.
>
> He has a peculiar method of fixing artificial teeth, which are not equalled by any other artificial teeth, as to beauty, firmness or durability.
>
> Tooth-powder—2/6 per box.

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* *Vide* New Haven Historical Society Papers, ii, p. 380. 1877.

> N. B.—Patent and all kinds of electrical machines, with medical and experimental apparatus for sale. Enquire as above or at Mr. Clark Greenwood, mathematical instrument maker, No. 199 Water Street, opposite the Coffee House.

In the same paper for June 1792 he advertises—

> *A NEW INVENTION.*
>
> To fix artificial teeth with springs, in such a manner that they may be put in and taken out by the person wearing them, with ease and in a moment. They save the trouble of tying and cannot be perceived, as to their appearance or fastening, from natural teeth.

Again in November 1792 he advertises himself as—

> possessing a perfect knowledge of Mr. John Hunter's practice of the human teeth (Surgeon Extraordinary to the King), with the general approbation of the first families of the United States as well as foreigners. He transplants and grafts natural teeth; those transplanted grow as firm in the jaw as the original teeth. Mr. Greenwood makes and fixes artificial teeth of a peculiar kind, the enamel of which is as beautiful as that upon the human teeth; they neither change their colour nor can they be distinguished from the natural, [etc.]

It is within the limits of possibility that the "peculiar kind" of artificial teeth here referred to were of porcelain. Duchateau of St. Germain had announced his discovery of porcelain teeth to the French Academy of Surgery in 1776. De Chemant made his first experiments in 1788 and brought his invention to the attention of the Royal Academy of Sciences in 1789, and although the improvements of this art made by DuBois Foucou were not officially recognized until 1808, when the Athenæum of Arts in Paris bestowed upon him its maximum recompense of a medal and crown for his improvement, nevertheless a knowledge of the invention of artificial dental substitutes of porcelain was prevalent in France, and many porcelain teeth of a crude character had been fabricated several years previous to Greenwood's advertisement of 1792. With his characteristic progressiveness and alertness in all that concerned his art, his reference to the "peculiar kind" of artificial teeth is highly suggestive that he referred to porcelain teeth, and if so he was undoubtedly the first to use them in America.

His reference to John Hunter's practice is interesting in that it shows his familiarity with what was the accepted standard English authority of the time. It was this work that he recommended to Horace Hayden, who as Greenwood's patient in 1795 received from him the impulse that launched him upon an honorable professional career fraught with such momentous importance to the professional organization and growth of American dentistry.

Greenwood moved during 1792 to No. 10 Vesey st. In 1794 he resided at No. 24 Vesey st., and in 1795 at No. 3 Church st., facing St. Paul's Churchyard. His name does not appear in the Directory of 1796, but the next year he was living at No. 14 (afterward No. 20) Vesey st., directly opposite St. Paul's Church. In 1798 he returned to No. 3 Church st., fronting St. Paul's Churchyard, and toward the close of the next year removed to No. 13 Park Row, four doors below the Theatre, where he continued to reside till 1805. This house was next to David Longworth's Shakespeare Gallery at No. 11 Park [Row], and on the last page of the New York City Directory of 1801, printed and published by D. Longworth, Greenwood's advertisement appears as follows:

> J. GREENWOOD, *Dentist to the Late President, George Washington,*—Informs the publick that he continues to perform every operation incident to the Teeth and Gums, from the fixing-in of a single tooth to a complete set. The approbation which the late *Illustrious Washington* was pleased to bestow upon him, he flatters himself, is a sufficient recommendation of his abilities as a dentist.
>
> *Extract from General Washington's Letter:* "January 6, 1799.—I shall always prefer your services to any other in the line of your present profession."
>
> N. B.—His prices are very moderate, as no person can exceed him in facility and

> neatness of performance. J. Greenwood may be consulted at his house, No. 13 Park, which is the fourth door (toward St. Paul's Church) from the Theatre.

Other dentists in the city at the time were Leonard Fisher, Fred Shanewolf, Rich. C. Skinner, W. S. Turner, John Wooffendale, and James McKinsey, who was also a man midwife, while Shanewolf carried on the business of a hair-dresser. Skinner lived in Fair [Fulton st.], No. 64, and was Surgeon Dentist to the City Dispensary at the corner of Beekman and Nassau sts.

Having purchased a house and farm at Newton, L. I., Dr. Greenwood removed thither in June 1805, but returned to the city the next year and took up his residence at 83 Beekman st. Early in the fall of 1806 he went to France, principally on professional business, and was in Paris during the month of November, returning at the close of the year. The *Weekly Museum* of March 7, 1807, contains the following:

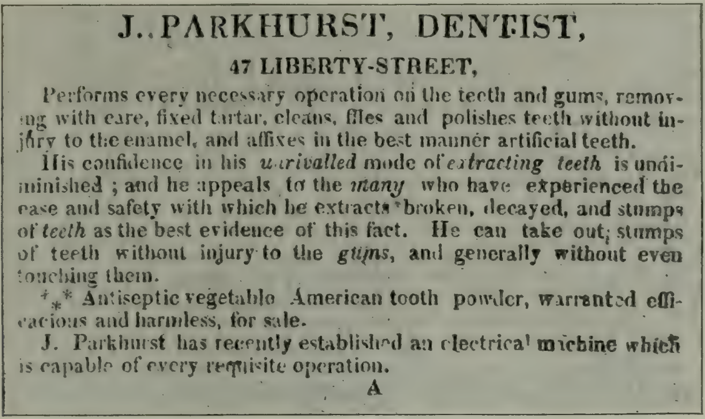
> J. Greenwood, *Surgeon Dentist,*—Informs his friends and the publick in general that he has returned from Paris, with great improvements in the line of his profession, and attends to his business as usual at No. 83 Beekman Street.

ISAAC JOHN GREENWOOD,

SON OF JOHN GREENWOOD.

In May he removed to No. 14 (now 20) Vesey st., where he had resided some ten years before. He afterward removed to No. 15 Park Row and there resided some three years, but in 1812 he was living at No. 51 (now 53) Murray st., "third house below Dr. Mason's Church."

In 1813 he removed back to No. 13 Park Row, where he continued to reside until his decease, though his office, after 1815, was at No. 3 Ann st.



J. PARKHURST, DENTIST,

47 LIBERTY-STREET,

Performs every necessary operation on the teeth and gums, removing with care, fixed tartar, cleans, files and polishes teeth without injury to the enamel, and affixes in the best manner artificial teeth.

His confidence in his *unrivalled* mode of *extracting teeth* is undiminished; and he appeals to the *many* who have experienced the ease and safety with which he extracts broken, decayed, and stumps of *teeth* as the best evidence of this fact. He can take out stumps of teeth without injury to the *gums*, and generally without even touching them.

⁎ Antiseptic vegetable American tooth powder, warranted efficacious and harmless, for sale.

J. Parkhurst has recently established an electrical machine which is capable of every requisite operation.

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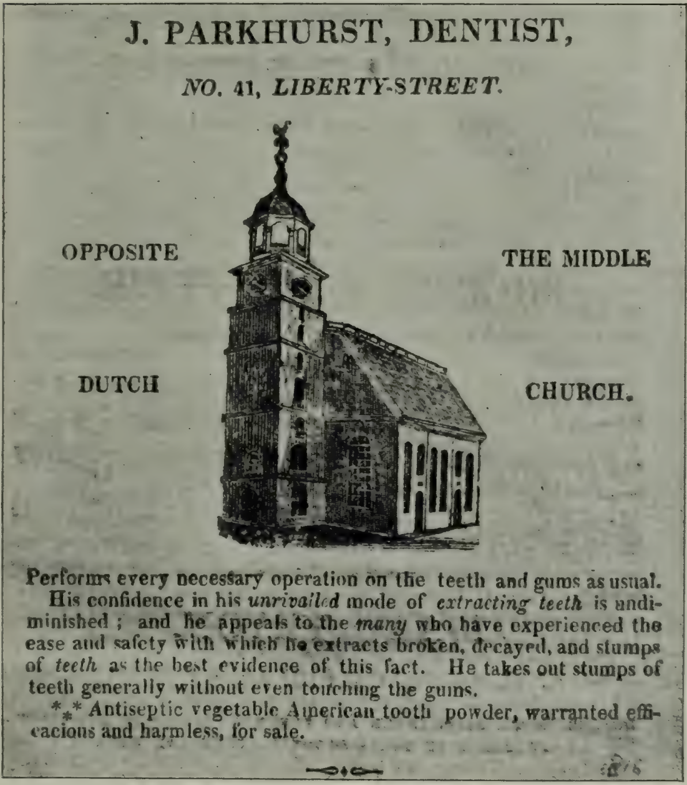


J. PARKHURST, DENTIST,

NO. 41, LIBERTY-STREET.

OPPOSITE THE MIDDLE DUTCH CHURCH.

Performs every necessary operation on the teeth and gums as usual.

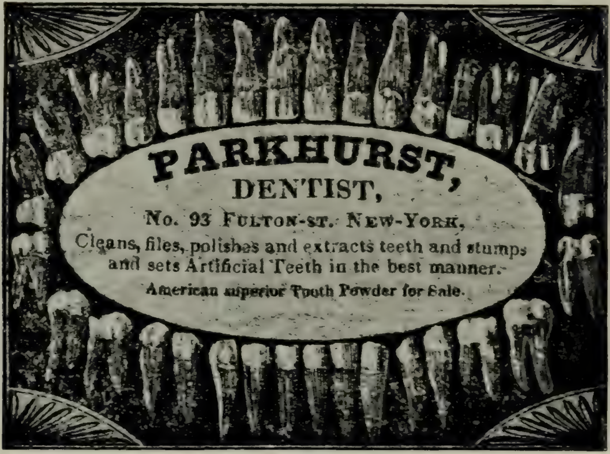
His confidence in his *unrivalled* mode of *extracting teeth* is undiminished; and he appeals to the *many* who have experienced the ease and safety with which he extracts broken, decayed, and stumps of *teeth* as the best evidence of this fact. He takes out stumps of teeth generally without even touching the gums.

⁎ Antiseptic vegetable American tooth powder, warranted efficacious and harmless, for sale.

Mr. Greenwood's health failed during the summer of 1818, and he died November 16, 1819, aged fifty-nine. He was succeeded in business by two of his sons, Isaac John Greenwood, M.D., D.D.S., and Clark Greenwood. The former, who remained in practice for twenty years, retiring in 1839, received the honorary degree D.D.S. from the Baltimore College of Dental Surgery at its second annual commencement, February 18, 1842. He died in New York May 14, 1865, aged seventy. Clark Greenwood died May 6, 1838, aged forty-one, in the vicinity of Jamaica, L. I., whither he had removed a few years earlier.

THE PARKHURSTS.

Among other contemporaries of John Greenwood practicing dentistry in New York were Jabez and William H. Parkhurst, whose advertisements may be followed for a long time in the city directories; and in 1808 Dr. Fay advertises himself as a surgeon dentist at No. 12 Bowery Lane.



PARKHURST,
DENTIST,
No. 93 Fulton-st. New-York,
Cleans, files, polishes and extracts teeth and stumps
and sets Artificial Teeth in the best manner.
American superior Tooth Powder for Sale.

J. and N. Parkhurst were merchants at 88 William st., at which address in 1806 Jabez Parkhurst advertises as a dentist. He died about 1829, in Fulton st., where he and his son were in partnership.

The careers of four practitioners will always command distinctive prominence in the history of American dentistry. They are John Greenwood, James Gardette, Josiah Flagg, and Edward Hudson. The impress which they severally made was upon dental practice, just as the career of Hayden and Harris similarly gave the vitalizing impulse to dental education and professional organization. All were pioneers, seers and prophets of an improved order, a higher attainment in dentistry and for dentistry. Neither time nor the limitations prescribed by the title of this communication will permit the elaboration of the details of the work which each of these honored men did toward the uplifting of our craft. I have dealt more particularly with the Greenwood biography and its relationship to New York dentistry in order that I may place upon record something of the importance and significance of John Greenwood's work. He was essentially a dentist *nascitur non fit,* inventive, progressive. He displayed that flexibility of resource necessary not only to successful practice but to the development of improved methods. In a letter written by his son, Dr. Isaac John Greenwood, to Jonathan Taft in November 1860* the writer gives many interesting details of the methods of practice pursued by his father. He states among other things that "white and yellow beeswax was used for the molds upon which

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**Dental Register of the West,* 1861, vol. xvi, p. 29.

artificial plates carved from ivory were made." Plaster-of-Paris models were not used by the Greenwoods until about 1820. The teeth made by John Greenwood for President Washington were carved to fit a wax model.

EARLY INVENTIONS.

In 1823 Isaac John Greenwood first used a steel bur mounted in a lathe for "excavating the cavity for the gums to rest in, in parts of and whole sets of teeth." He claims the first use and discovery of wooden pivots to be used in bone or mineral teeth. He used straight-grained, well-seasoned hickory wood for that purpose, and after approximately shaping it he drew it through the holes of a wire-drawing plate to condense the fiber and bring the wooden dowel to the exact gage of the drill used to enlarge the root-canal so as to assure an accurate fit. The first mineral teeth with platinum pins seen by the son of John Greenwood were presented by Colonel Aaron Burr to John Greenwood, whose patient he was. Burr had brought them from Europe. This must have been not earlier than 1812, as Burr went to Europe in 1808, remaining abroad for four years.

In the same letter Isaac John Greenwood states: "My father was the first to use the foot drill, and he made it himself from an old spinning-wheel of my grandmother's, and since his death I myself used it—the same one—altogether in my practice for twenty years, and have it yet." This device would seem to have been the direct American ancestor of the dental engine—its French ancestor being undoubtedly the *porte écarissoir* of Jourdain in 1756.

THE BEGINNINGS OF PROFESSIONAL ORGANIZATION.

It was from and around this nucleus that the legitimate practice of dentistry in New York had its origin, and which during the period from 1812 to 1840 had a comparatively rapid and vigorous growth. The seed sown by John Greenwood in the mind of Horace Hayden had germinated and borne fruit, and when he and Chapin Harris were perfecting their plans for the creation of an organized dental profession, the thought of Hayden naturally turned to New York as the field of greatest promise for the launching of his enterprise, because it was there that the professional *esprit de corps* which it was the purpose of his plan to cultivate and perpetuate had already manifested its most encouraging activity. There was already in existence the Society of Surgeon Dentists of the city of New York and the Dental Association of Western New York before the first national organization, the American Society of Dental Surgeons, was called to order for purposes of organization, at 10 o'clock August 18, 1839, by Horace H. Hayden, then in his seventy-first year. There can be no room for speculation as to why Hayden was led to launch this pioneer association in New York, for in his opening remarks on that occasion he is recorded* as follows:

> The formation of a National Society of Dentists, he remarked, had been long a favorite project with himself; and he was happy to say that he had never found himself wholly alone in this desire. Many years ago he had consulted with the elder Hudson of Philadelphia, who was favorably inclined to such an association. On a visit to Boston and other eastern cities he had consulted his professional brethren on the same question. He found them ready to co-operate in any practicable scheme for the elevation of the profession, but they were inclined to doubt whether anything useful could be accomplished by anything other than individual efforts. Of any advantages that could result from associated influence they were mostly skeptical, especially in Boston. It was somewhat otherwise with a few of the profession in the city of New York. Here several of his brethren were anxious to disseminate knowledge, cultivate social intercourse, and make an effort to elevate the profession of dental surgery from its present neglected condition to the dignity of a science. In Philadelphia, Baltimore, Washington, and a few other cities his plan was received with favor by some of the individuals with whom he consulted.

**American Journal of Dental Science*, vol. i, 1839, p. 158.

As illustrative of the growth of dentistry in New York from John Greenwood's time to the period of organization of the National Society in 1839, Charles C. Allen, who practiced at 13 Park Place, writing in 1846 (in an article in the *New York Dental Recorder* for September of that year), says:

> Thirty years since, there were but three or four competent dentists in the city of New York, and now we number more than one hundred and twenty. Nor is this surprising increase confined to our principal cities; they have come upon the land and overrun it like the locusts of Egypt, and the wonder is equally great whence they came and what is their destiny.

It was to this established center that Horace Hayden brought the glad tidings of a larger professionalism, and it was there that he found a sympathetic acceptance of his message and a practical furtherance of its objects. It is noteworthy that of the fifteen men who signed the constitution of our first National Association at its organization meeting, ten were New York practitioners. Of the first published list of subscribers to the *American Journal of Dental Science,* containing a total of 176 names for the whole United States, New York furnished a quota of fifty-six subscribers, thirty-one of whom were practitioners in New York city, and of this number six subscribed for twenty copies and one for forty copies of the pioneer dental periodical of the world; which figures furnish practical evidence of the earnestness of these pioneer dentists in furthering the professional development of their calling.

THE ETHICS OF EARLY ADVERTISING.

We have been inclined to look back with a certain degree of patronizing superiority upon the advertising methods of these our professional forefathers, but in that I think we do them injustice, if we do not also discredit our historical judgment at the same time. While quackery and the professional mountebank flourished then as now, advertising by means of circulars and in the public press had not at that time been put under the ban of professional disapproval; indeed, in the earlier period of our national growth a reasonable and dignified use of printer's ink would seem to have had a certain justification growing out of the social conditions of the times and the sparsely settled state of the country. Our great cities of the Atlantic seaboard were then but villages, comparatively speaking; few of their streets were paved, the houses were not numbered, or but irregularly so. Even in Paris during the French Revolution the houses had not been numbered. In the Colonial period of America the mails were transported by post-riders twice a week between Boston and New York and New York and Philadelphia. We now travel as far in an hour as our ancestors traveled in a day. There was no railroad and telegraph, the papers were for the most part small weekly publications. One of these, the *Atlas,* a New York paper, as late as September 7, 1833, refers to this subject in an editorial paragraph as follows:

> *Travelling.*—Passengers who leave Philadelphia in the morning now arrive in this city in the afternoon, making the trip in between eight and nine hours. In 1775 a stage which made the journey in two days was spoken of as an astonishing affair.

Lacking as they did the several means of rapid intercommunication which are in these modern times a necessity, and which are to us mere commonplace features of life, professional newspaper advertising had not *per se* become vulgarized in the same sense that it has become under modern conditions, and in the study of these old professional newspaper advertisements one may easily distinguish the announcements of the self-respecting legitimate practitioner from the charlatan by the internal evidence of the advertisement itself. Not only was it customary and considered to be good professional form among our predecessors of the early time to advertise, but to give testimonials as well. For example, the eminent Dr. Jenner, discoverer of vaccination, did not hesitate to give to

DuBois de Chemant a laudatory testimonial concerning the merits of his "patented mineral-paste teeth" in 1803.

In judging of the professional status of these pioneers we are in justice compelled to estimate their character in the light of the times in which they lived and in relation to the circumstances surrounding them. It would be as manifestly unjust to measure their acts by our modern ethical standards as it would be for us to condemn our first parents upon an indictment of immodesty because their ideas as to wearing apparel differed materially from our twentieth century standards of propriety in that respect. To those who interest themselves in the study of our professional history it is a constant gratification that these men did advertise, for that custom has furnished the most available source of our information concerning their professional work.

HISTORY YET UNWRITTEN.

We are lacking a satisfactory record of dental professional activity in New York from about 1830 to 1860. We need fuller data as to the group of New York practitioners who represented the best professional ideals at the time of the advent of those French charlatans Mallan and the Crawcours, about 1833. The story of that event needs to be fully and carefully written, for it was to the "amalgam war" what the Boston massacre was to the Colonial revolution. The references to the Crawcours in early dental periodicals are but fragmentary and almost traditional in character, yet they were the counter-irritants in a professional outbreak which was the reaction of legitimate practice against the methods of the quack and mountebank, and which did much to prepare the way for the work of Hayden and his colleagues.

We need to know definitely about the two societies, one in New York city and its allied association in western New York, that were in existence previous to the formation of the first National Association, and we need to know the history of the movement in western New York which crystallized in the formation of the College of Dentistry of Syracuse in 1850 under the leadership of Amos Westcott, much of whose work and that of his colleagues, especially with relation to the amalgam question, will probably be found in the early archives of the Onondaga County Medical Society, if these can be located. I feel sure that among the members of this representative society of the great Empire State there must be some who have enough pride in the splendid work done by her long line of illustrious dental practitioners to interest them in securing to future generations the record of dentistry in this state—a record which, even fragmentary as it yet is, is nevertheless one of which the whole profession has every reason to be proud.

If I shall have aroused an interest in this subject, so that as seed sown upon fertile ground it shall in due course of time enable us to reap a harvest of practical historical results, I shall have fully accomplished my purpose in preparing this paper for your consideration.

MOUTH-BREATHING.

By **HERBERT A. PULLEN, D.M.D., Buffalo, N. Y.**

(Read before the Dental Society of the State of New York, at its annual meeting, Albany, May 11, 1906.)

ONE of the most serious abnormal conditions with which the rhinologist and the orthodontist have to deal, and one as intimately connected with the disturbance of normal function and structure in the field of the one as in that of the other, is the partial or complete loss of normal respiratory function through the obstruction of the nasal, naso-pharyngeal, and oro-pharyngeal air-passages, causing oral respiration, commonly known as "mouth-breathing."

That this condition, with all of its injurious results upon the development of the bones of the head and face, the disfiguring of the features, and the undermining of the general health, is becoming more prevalent, one hardly needs statistics to show, in view of the great numbers of those afflicted with this trouble who may be seen in all walks of life.

FIG. 1.

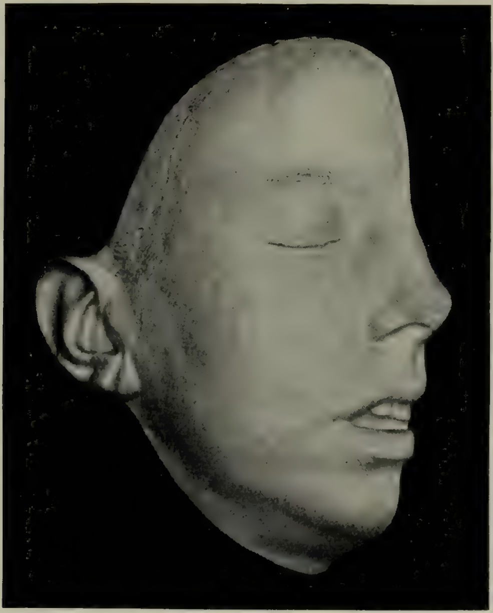
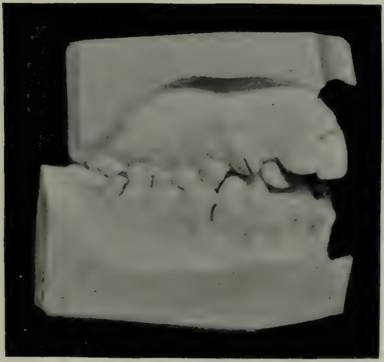


Fig. 1 represents the face mask of a typical mouth-breather, the characteristic features noticeable being the open and drooping mouth, the short upper lip, the undeveloped nose and undilated nostril, and the malocclusion of the teeth.

The dull, vacant expression of the face of the mouth-breather is more noticeable in the photographs to follow than in the face mask, which somewhat disguises this expression because of the eyes being closed. The vacant stare especially accompanies the presence of large adenoids, and corresponds perfectly to the psychic abnormality. It is said to be caused chiefly by the stagnation of the lymph at the base of the skull.

On examination of the relations of the arches of the teeth (Fig. 2) of the patient whose face mask has just been shown, we will see that the case belongs to the first division of Class II (Angle), being bilateral in the distal relation of the lower arch, with protruding incisors in the upper arch.

Fig. 2.



It has been my experience that the mouth-breather may present a malocclusion of any one of the different classes into which it is possible to divide malocclusion, rather than of only one or two of them, as has been suggested by other observers, and the shapes of the arches of teeth are varied and the extent of the malocclusion measured somewhat by the degree to which oral respiration is resorted to. The voice has a muffled tone similar to the tone of a stringed instrument played with a damper. Phonation is thus very seriously impaired, as is also pronunciation of such letters as m and n, which in the muffled voice sound like b, an impairment known to medicine as "rhinolalia clausa posterior."

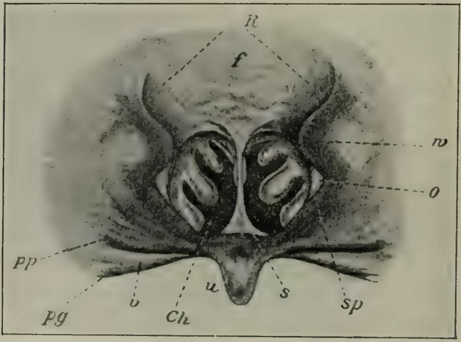
Before proceeding with the etiological factors present in mouth-breathing, it might be well to refresh your minds with the anatomical structure and physiological function of the region of the nasopharynx, with which we will have to deal in a discussion of certain pathological manifestations which are causative of a structural and functional change in the normal tissues.

A posterior rhinoscopic view of the entrance to the nasal passages, or choanæ, is seen in Fig. 3, being an image obtained by reflection from the back part of the pharynx. The nasal septum, in the median line, separates one-half of the nose from the other. The dark spaces on each side represent the choanæ, or nasal passages proper, and the three-armed processes extending into this space bilaterally are the turbinate bones. The muscular tissues below include the pillars of the pharynx and the uvula. At the top of the picture is the vault of the pharynx, and on each side the tubal folds. The nasal cavity is surrounded on all sides by a collection of pneumatic spaces, called the accessory sinuses, arranged in three large pairs: the maxillary sinus or antrum, the frontal and sphenoid sinuses, as well as the labyrinth of the ethmoid, which is made up of a number of pneumatic cells.

In the vestibule, or anterior portion of the nose, the only parts which it is necessary to take note of in connection with our subject are the cartilaginous portions of the septal cartilages which form the alæ of the nose, and which in the normal breather are sufficiently stiff to enable them to resist the pressure of the current of the inspired air. If the lowest portion of the alæ is too soft, on account of prolonged mouth-breathing or of atrophy due to disuse, or if there is an insufficiency of the dilator muscles in their substance, a serious impediment to respiration may result from collapse of the alæ, which can be obviated only by wearing some apparatus to support them.

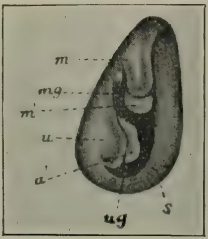
A rhinoscopic image of the right half of the nose, looking through the vestibule, reveals the middle and inferior turbinate bones and the septum in Fig. 4. The lining membrane of the vestibule is very similar in structure to the adjoining epidermis, and the sebaceous glands which it contains have nothing to do with the respiratory function. The hairs found in this region, however, act as a sieve in straining the inspired air, and in collecting dust particles which might otherwise pass into the air-passages beyond, and cause irritation.

FIG. 3.



—*Grünwald.*

FIG. 4.



—*Grünwald.*

Fig. 3: Image obtained by posterior rhinoscopy. *R*, Rosenmüller's fossa; *Ch*, choanæ; *n*, tubal fold; *o*, tubal orifice; *f*, fornix or vault; *s*, septum; *u*, uvula; *v*, soft palate; *sp*, salpingo-pharyngeal fold (posterior pillar); *pp*, and *pg*, palato-pharyngeal and palato-glossal arch.

FIG. 4: Rhinoscopic image of the right half of the nose. *m-m'*, middle; *u-u'*, inferior turbinate; *mg*, middle; *ug*, inferior meatus; *s*, septum. The illustration has been constructed from several images obtained with the head turned slightly to the right.

Glands first make their appearance in the true mucous membrane of the internal nasal passages, and that part of the mucous membrane in which the olfactory cells are situated is called the olfactory region; the remaining portion the respiratory region. Anatomists have proved that there is a direct connection between the olfactory region and the lymph channels of the dura mater, of which I shall say more later. The glands of the respiratory region and of the accessory sinuses secrete chiefly mucus, a few serous glands being found there. In the olfactory region the glands are of a tubular albuminous variety, and produce a watery secretion.

"The chief functions of the nose consist in the perception of odors, and the warming, cleansing, and moistening of the inspired air. For this purpose the inspired air must come into contact with as great an extent of the olfactory membrane and the moist warm surfaces of the mucous membrane covering the turbinate as possible. Accordingly the inspiratory air-current, instead of hugging the floor of the nose, follows an elliptic course from the vestibule to the middle and superior turbinates, and from this point along the roof of the nose and beneath the sphenoid sinus to the posterior extremity of the inferior turbinate. During this course it does not remain in the same vertical plane, but deviates toward the median line soon after it leaves the anterior extremity of the middle turbinate. The expiratory air-current follows the same course." (Grünwald.)

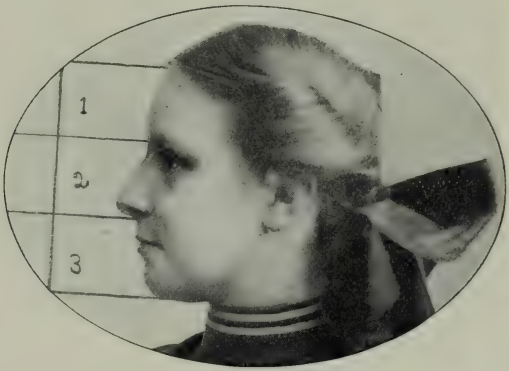
It is obvious, therefore, that respiration is impeded only where there is an alteration of the lumen along the track described, and that even an extensive obstruction in other portions of the nose —as for instance, on the floor of the middle meatus—may produce no symptoms; while on the other hand, even marked deviations may be present without interfering with respiration if their position is such as to permit the respiratory current to avoid them and pass into some other cavity.

If the nasal and post-nasal passages are unobstructed, every inspiration empties the ethmoid veins, and through them the longitudinal sinus and cavernous plexus. When there is obstruction to nasal respiration, the circulation at the base of the skull is interfered with, and a long train of ills brought about which interfere very greatly with the health of the individual. In the first place, the quantity of air aspirated through the mouth in a case of nasal obstruction is not equal to that of normal nasal respiration, and the system suffers from the lack of sufficient oxygenation. I will speak of another theory a little farther on, concerning insufficient oxygenation of the tissues in these cases due to deficient nutrition of the centers which govern the activity of the blood and lymph plasma, which carry the oxygen to the most remote tissues of the body.

One of the earliest signs of nasal obstruction is a feeling of dryness in the throat on awakening, due to the dehydration of the mucous membrane of the pharynx through evaporation while the mouth is kept open at night. If there be but a slight degree of obstruction to nasal respiration the mouth will be reflexly closed during the day, but during the night the reflex is done away with while sleeping, and breathing through the mouth takes place, causing the dryness of the pharyngeal mucous membrane. This latter condition favors the development of infectious bacteria which in normal respiration would be rendered harmless by suspension in the mucus or thrown out. Permanent mouth-breathing occurs day and night, and the effect on the health is much more harmful.

Catarrh usually follows, and varying degrees of chronic irritation, which together with the anemic condition of the general system through insufficient oxygenation, and consequent diminished powers of resistance, prepare the way for the inception of the dread tubercle bacillus, as well as other bacteria of a harmful nature.

FIG. 5.



Defective development of the bones of the face and head and other parts of the body are noticeable as the result of mouth-breathing; the lower thoracic walls are sometimes contracted in the region of the true ribs, due perhaps to the fact that the inspiratory tension of the diaphragm is not compensated, for want of the amount of air necessary to distend the inferior portions of the lungs, the pull of the muscles causing retraction of the ribs, which, in children, are soft and yielding and sometimes rhachitic.

The normally developed face may be divided into thirds which correspond in size, as may be noticed in Fig. 5, the forehead, nose, lips, and chin being proportionate in length. In the mouth-breather, the middle third is very often deficient, due, no doubt, to the more noticeable lack of development in the proximity of the causative disturbances of nutrition and development. Fig. 6 illustrates this lack of development of the middle third of the face of a mouth-breather. In the mouth-breather of Class II (Angle), the recession of the chin is a very noticeable feature.

FIG. 6.

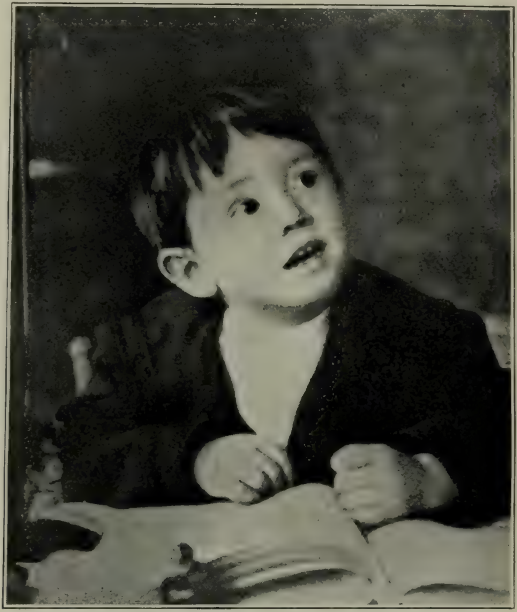


FIG. 7.

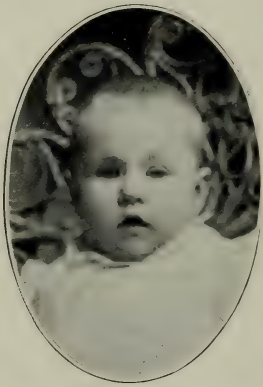
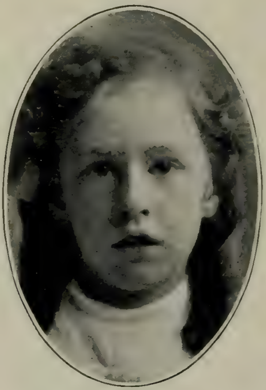


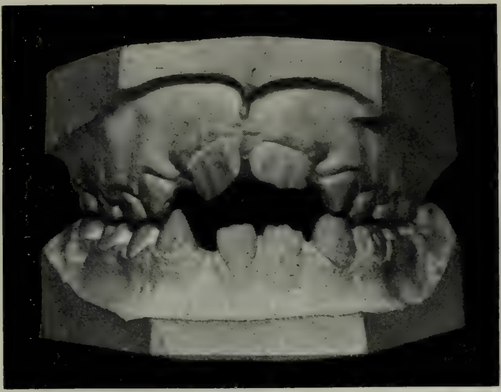
FIG. 8.



Eye and ear troubles are commonly associated with nasal obstruction and mouth-breathing; also psychic depression and many reflex neuroses of a complex nature; even epilepsy has been found in some instances to be of nasal origin.

Figs. 7 and 8 are from two photographs of a little child who is a sufferer from mouth-breathing of post-nasal obstruction origin, at the ages of six months and seven years respectively. The open mouth and other symptoms are present in both pictures, showing that the mouth-breathing was of early origin, perhaps even some time before the first photograph was taken. The casts of this child's teeth in Fig. 9 show the effect of this habit upon the development of the arches. Both arches are contracted, there being insufficient room for the eruption of the upper and lower lateral incisors, and in addition, the lack of anterior occlusion and the recession of the lower arch exhibit variations from normal occlusion not uncommon to these cases.

FIG. 9.



Regarding the variation of the occlusion from the normal in mouth-breathers, they are found in all classes of malocclusion, and the extent of the malocclusion may vary in degree, from the simplest to the most complex inharmony of occlusion.

One of the most aggravating forms of malocclusion associated with mouth-breathing is that of the "open-bite" malocclusion, as it has been termed by some writers. Lack of anterior occlusion and "infra-occlusion" are similar designations for the same condition.

FIG. 10.

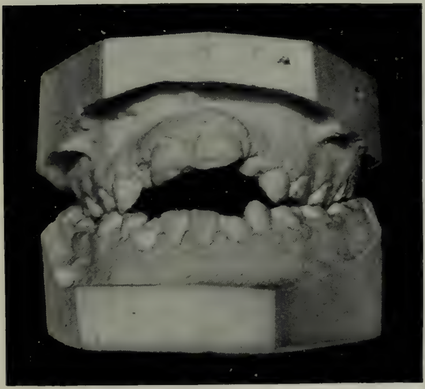
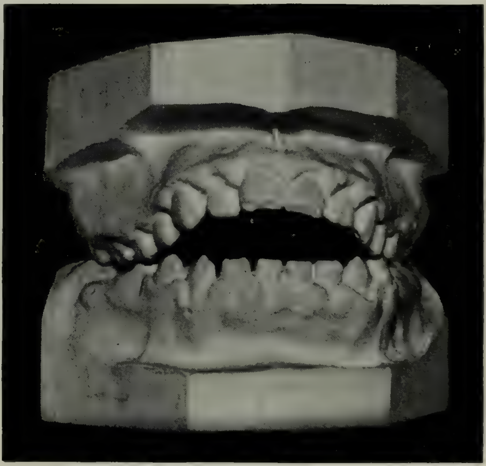


FIG. 11.



Figs. 10 and 11 illustrate two such cases, one belonging to Class I, the other to Class II (Angle).

In these cases there seems to be not only an arrest of anterior development of the alveolar process and eruption of the incisors, but also an excessive development in the molar region in the direction of the long axis of the teeth, probably due to the effort on the part of nature to secure molar occlusion even when the arches are held apart an abnormal distance. Just why this same law should not hold good in the anterior part of the mouth is rather difficult to understand, unless because of the contraction anteriorly, which might increase the resistance to the easy eruption of the incisors to occlusion.

Figs. 12 and 13 exhibit two other cases of malocclusion, belonging to Classes I and II, both of which are associated with mouth-breathing, yet presenting very different subjective symptoms, and necessitating essentially different methods of treatment in the restoration to harmony in occlusion.

It will be interesting to note the variation of the shapes of the two upper casts of these cases from the occlusal view in Figs. 14 and 15. In Fig. 14

Fig. 12.

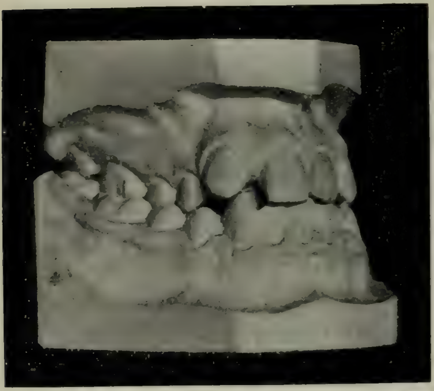


Fig. 13.

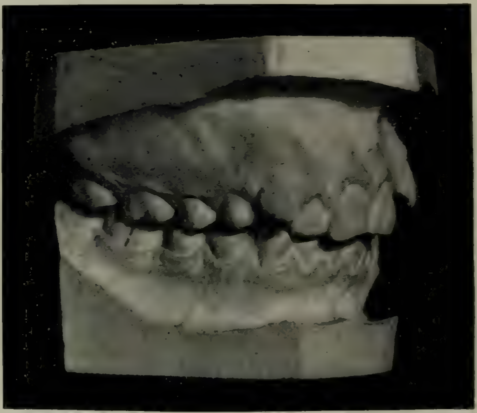


Fig. 14.

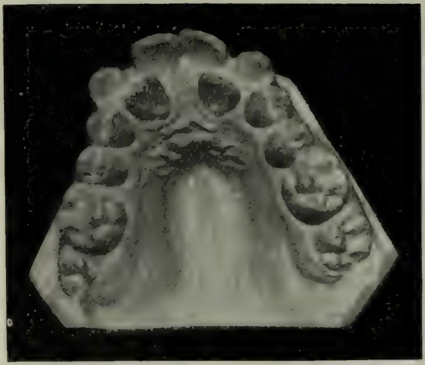
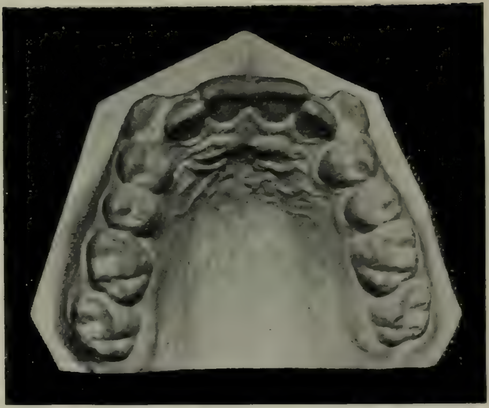


Fig. 15.

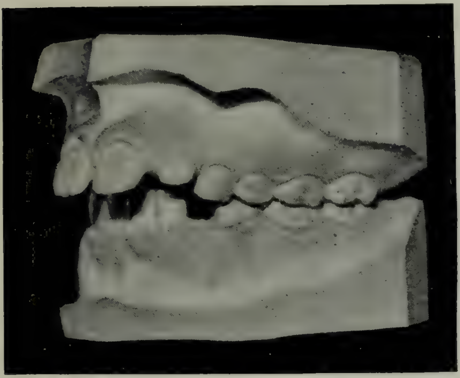


a high arch is noticed, with considerable narrowing throughout. In the cast on the right the arch is comparatively low, with the narrowing chiefly in the anterior portion of the arch.

Fig. 16 illustrates the casts of the arches of teeth of a mouth-breather of Class II, the upper arch being protruded and very narrow.

Naturally the question might occur to you, why do not the arches of teeth assume a distinct formation and malocclusion in the deformed condition associated with mouth-breathing, instead of presenting such a variety of malocclusions in these cases? It is my opinion that the variation is caused by the varying etiological characteristics of mouth-breathing, as well as the period of time in which arrest of development occurs, and the particular region most directly affected by this non-development.

Fig. 16.



Again, the variation in the height of the vault in these cases is a question not very well understood. It has been claimed that the high vault usually accompanies mouth-breathing, but I do not believe that this statement can be maintained, in view of the fact that many investigators have found the arch comparatively low in many of these cases.

The difference in atmospheric pressure because of nasal obstruction in infants (above and below the palate) as causative of the high vault is a theory of long standing which I shall not attempt to dispute. It is also a well-established fact that the muscles of the lips and cheeks, either through use or disuse, have a very important influence on the shape of the arch in mouth-breathers.

Mouth-breathing is usually called a habit, but in reality is a necessity, because of the inability to breathe through the nose, there being some impediment in the nasal tract which will not allow the air to pass by it. Among the various obstructions to nasal breathing may be mentioned deflection of the nasal septum, adenoids, hypertrophied tonsils, and turbinate bones, as well as the diseased conditions resulting from syphilis or tumors, polypi, and cysts.

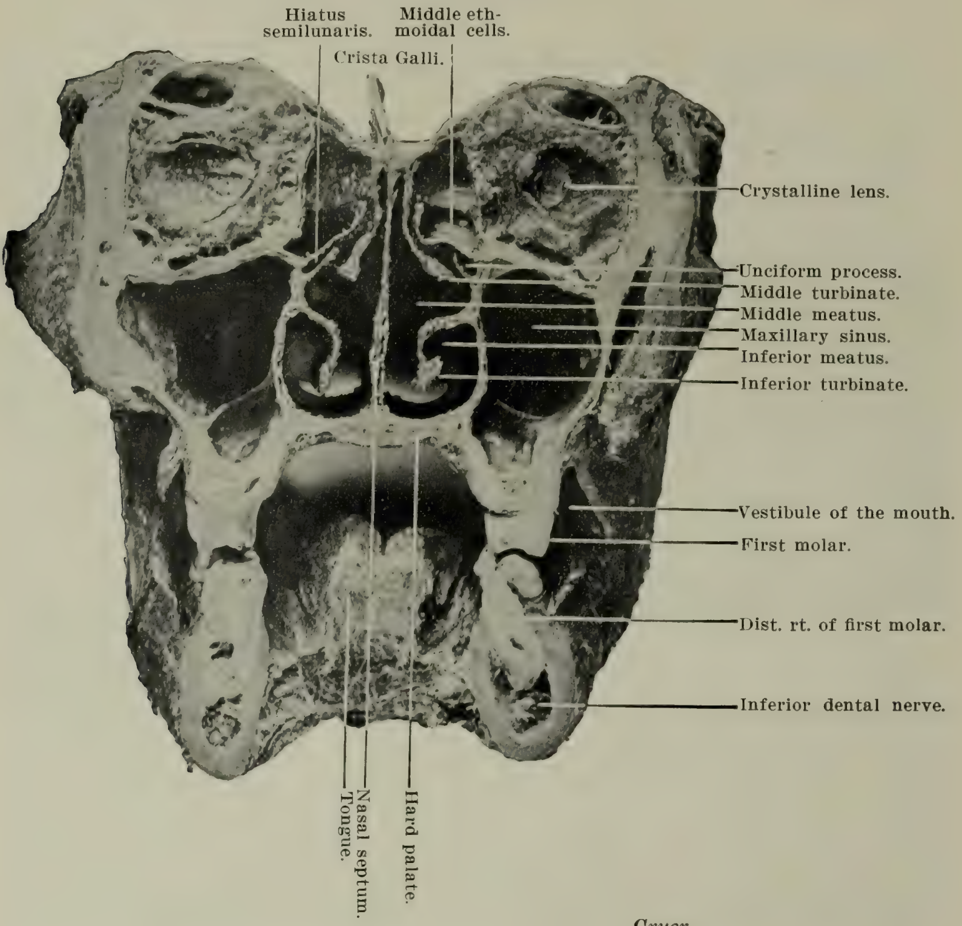
Ziem's experiments in producing nasal stenosis in young animals by occluding one-half of the nose artificially, with the result of the asymmetrical development of the two sides of the nose and adjacent bone tissues, the obstructed half being undeveloped, and this arrest of development extending to all the adjacent tissues on that side of the face, are worthy of note, and have been referred to by various authors in essays related to this subject.

In the normal subject the nasal septum occupies a position in the nasal cavity dividing one-half of the nose from the other. Slight deviations are frequently seen in people who are not troubled with nasal stenosis to any degree; but where the deviation from the median line is at all extensive, occlusion of the side toward which the deviation takes place occurs, with all of the consequent ill effects of enforced mouth-breathing. Fig. 17 illustrates the nasal septum in its normal relationship in the median line, the choanæ on each side being equal in size.

Fig. 18 illustrates another skull section showing marked deflection of the septum. The choana on the side toward which the septum is deflected is very much smaller than the other, and when filled with the soft tissues during life, must have been almost completely occluded, and we would have every reason to believe that the subject was a mouth-breather.

The cause of the deflection of the nasal septum is ascribed by Delavan as "due to trauma or improper nutrition, usually the latter." The theory of improper nutrition as causative of the deflected septum and other abnormal conditions in the naso-pharynx I wish to speak of later in connection with a theory which has been recently presented to us by Sajous, in his work on "The Internal Secretions and the Principles of Medicine," because the latter's hypothesis and deductions vary considerably from those of other investigators.

Fig. 17.*



—*Cryer.*

Operations for the straightening or partial removal of the septum, when deflected, are of daily occurrence, and are followed by almost immediate relief to the respiratory mechanism.

A very generally accepted cause of mouth-breathing is the hypertrophy of the faucial tonsils, and from the frequency with which operations for their removal are performed their diseased condition cannot be judged uncommon. Aside from causing mouth-breathing, the faucial tonsils are frequently the cause of infection and disease, because of the hypertrophied condition and improper performance of function. In just what manner the hypertrophied faucial tonsils cause mouth-breathing, unless by their obstruction to the free passage of air through the pharynx, it is not easy to determine, and different opinions on the subject by various investigators are extant. Recently, while pursuing my studies of this subject, I have been invited to the clinic of Drs. Sanders and Hayward of Rochester, where I have seen the skilful removal of enlarged tonsils and adenoids in some of my own patients who have been suffering from the effects of one or the other of these abnormal conditions.

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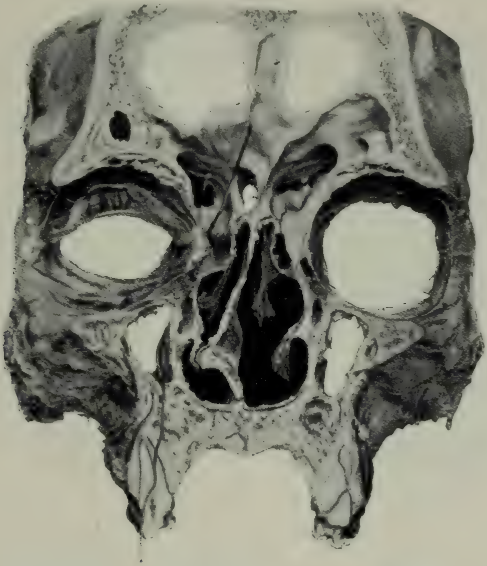
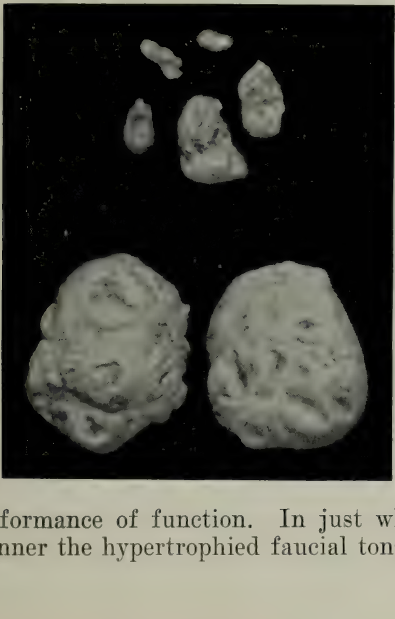
*Figs. 17 and 18 are taken from "Studies of the Internal Anatomy of the Face," by M. H. Cryer, M.D., D.D.S.

FIG. 18.



—*Cryer.*

FIG. 19.

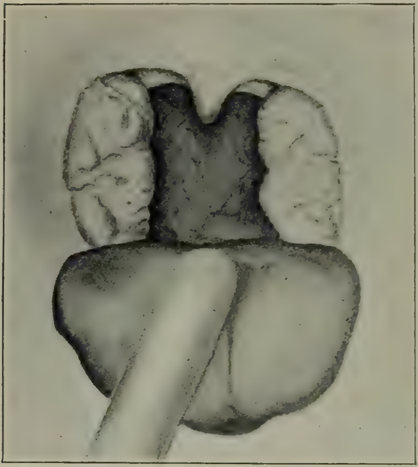


It may be interesting to you to note the extreme enlargement of the tonsils in Fig. 19, being those found in an infant of two years, and removed, together with the adenoid tissue seen at the top of the illustration, by Dr. Sanders. This photograph shows the actual size of the removed tissues.

Fig. 20 is made from a drawing (Grünwald), and illustrates the hypertrophied tonsils and their relationship to adjacent tissues of the pharynx.

Hypertrophy of the turbinate bones, especially the inferior, is not an infrequent cause of nasal stenosis and consequent mouth-breathing. Fig. 21 exhibits a portion of the inferior turbinate which was removed from the nose of one of my patients who was suffering from partial nasal stenosis from this cause.

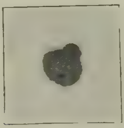
Fig. 20.



—*Grünwald.*

One of the most common causes of mouth-breathing is found in the hypertrophy of the pharyngeal, or Luschka's tonsil, which is situated in the vault of the naso-pharynx, usually just out of sight above the uvula, and lying along the posterior portion of the pharynx. Fig. 22 illustrates a mass of this enlarged glandular tissue from a posterior rhinoscopic view, and it can be seen how easily the entire nasal passage may become occluded from this cause, and produce mouth-breathing.

Fig. 21.



A segregated mass of adenoid tissues which were removed from the throat of a ten-year-old boy by Dr. Sumner Hayward of Rochester, may be seen in Fig. 23.

After removal of these obstructing lymphoid tissues in the mouth-breather, the nasal respiration is at once restored, with all of its beneficial results to the general health. At the same time, if operated upon at an early enough age, the improvement in the facial lines is very marked, and the lines of distress disappear, although the malocclusion remains as evidence of the trouble, unless it also is treated and normal occlusion is restored.

Besides being a direct cause of nasal stenosis, adenoid vegetations may in another way impair the general health by causing pressure on certain centers governing nervous functions, nutrition, and oxidation processes throughout the body, if we accept Sajous' theory of the internal secretions and principles of medicine alluded to above.

Sajous' investigations have shown that the adrenals were directly connected with the anterior pituitary body, through the solar plexus, the splanchnic nerves, and the cervico-thoracic ganglia of the sympathetic. He says:

"Indeed, this diminutive organ, hardly as large as a pea, and now thought to be practically functionless, proved to be the most important organ of the body, as the governing center of the adrenals, and therefore of all oxidation processes.

"The thyroid gland, the anterior pituitary, and the adrenals were found to be functionally united, *i.e.* to form an autonomous system, which we termed the 'adrenal system.'

"In general diseases, what has been termed the patient's 'vitality' or 'vital resistance' thus became ascribable to fluctuations in the anterior pituitary body's functional efficiency. In other words, over-activity of this organ, by correspondingly enhancing the production of adrenal secretion, was found to increase metabolism and the activity of all organs in proportion; while depression of its normal activity, by inhibiting the production of adrenal secretion and thus reducing the quantity of oxygen distributed throughout the entire organism, proportionately lowered the activity of all vital processes.

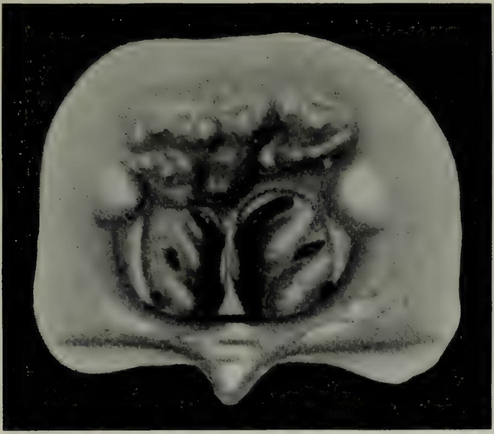
"The posterior pituitary body, far from being the insignificant vestigial organ it is generally thought to be, was found to stand second in importance only to its mate, the anterior pituitary body. Indeed, it proved to be the chief functional center of the nervous system."

His conclusions regarding the co-ordinate functions of the anterior and posterior pituitary bodies are as follows:

"The pituitary bodies are the general centers which actively sustain cellular metabolism; the anterior pituitary insures oxygenation of the blood and all oxidation processes; the posterior pituitary adjusts the vibratory rhythm of all nervous impulses which incite and govern functional activity."

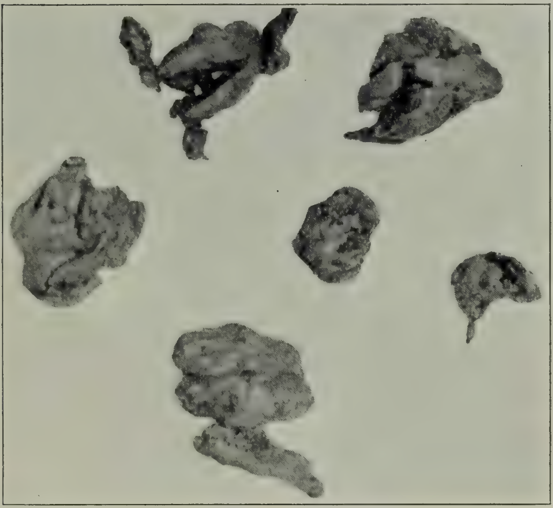
As to the particular importance which we attach to the above theory in its relation to hypertrophied tissues in the nasopharynx, we are indebted to Dr. F. Park

FIG. 22.



—*Grünwald.*

FIG. 23.



Lewis of Buffalo, N. Y., who—in a paper read before the American Society of Orthodontists in 1903—first called our attention to the conclusions of Sajous, discussing at the same time the wonderful possibilities in the field of rhinology, ophthalmology, and orthodontia if early intervention in the treatment of pathological conditions in these fields is persisted in, because of the advantages of development during the age of growth, when nutritive channels are made free and normal conditions of health restored.

Quoting from Dr. Lewis's paper concerning the relations of the pituitary bodies and their afferent and efferent vessels, and the proximity and danger of impingement of hypertrophied growths in the naso-pharynx, I may perhaps be able to more clearly show the connection:

"The pituitary body, it will be remembered, is a bilobed organ resting in the sella Turcica."

The conclusion concerning it which Sajous reaches is:

"The posterior pituitary body is the general center of the organism, from which all of the nervous energy transmitted by the bulbar centers arise.

"Now, the anatomical relationships are such that immediately above the site occupied commonly by adenoid tissue is the foramen lacerum medium, filled in a normal condition by fibro-cartilaginous tissue, and opening into the carotid canal, which bears the carotid artery, the superior cervical sympathetic, and the lymphatics.

"The important bearing of the sympathetic will be seen when we recall the fact that from the cavernous reflexes branches are given off to the mucous membrane of the sphenoid sinus, to the dura mater of the basilar groove, the pituitary, the third, the fourth, and sixth nerves, and to the Gasserian ganglion of the fifth, and also send a branch to the ophthalmic ganglion.

"Now, when these foramina are narrowed by pressure from adventitious growths or crowding from any cause whatever, the function of the nerves and nutritive channels is interfered with," causing abnormalities in the area of distribution, "with resultant atrophy, neuralgia, or other trophic disturbance of the part involved."

Concerning this, Sajous has to say that—

"It will be apparent that any lesion capable of blocking the afferent and efferent impulses that traverse it at all times, and which represent the aggregate of the organism, inciting and governing energy, must necessarily compromise life, or the functions of an organ to which the blocked nerves are distributed.

"The large mortality under chloroform narcosis in adenectomy is in all probability due to the shock conveyed to the posterior pituitary body through the foramen lacerum medium immediately over the lymphatic enlargements.

"It will readily be seen, therefore, that whatever interferes with the nutritive functions at the vault of the pharynx may disturb the subsequent development of the whole skull and of its contents."

The very close relationship which exists between the tissues of the pharynx and the vessels of the foramen lacerum medium may be seen from observation of the position and direction of the more nearly vertical probe in Fig. 24, it being passed through the foramen lacerum medium and emerging into the space occupied by the pituitary body. The inferior opening of the foramen lacerum medium is in the adenoid region, and the vessels which enter it are very apt to be impinged upon by hypertrophy of the pharyngeal tonsils, and the nutrient and nerve supply to the pituitary bodies cut off enough to materially affect the proper performance of the functions of these organs, the disastrous effects of which on the general health can only be surmised, since the governing center of the whole organism is impaired.

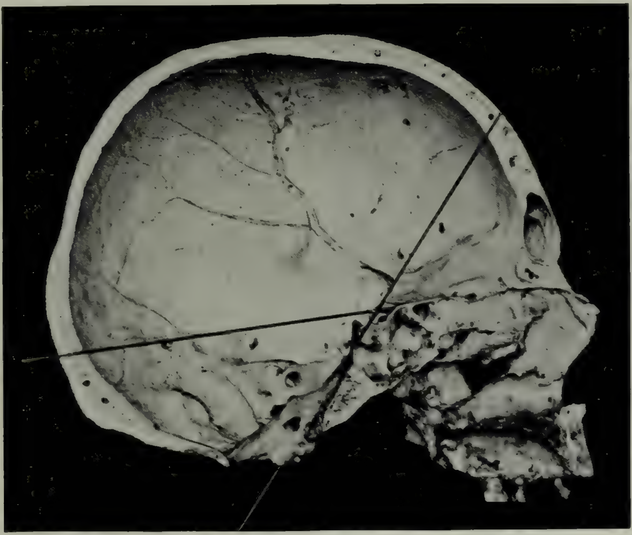
The horizontal probe in Fig. 24 passes through the optic foramen into the space occupied by the pituitary bodies, illustrating the very close relationship between the vessels of the eye and the pituitaries, and suggesting the probability of visual defects and insufficiencies from hypertrophied tissues in the naso-pharynx.

Even granting that these theories should not prove to be all that has been claimed for them by their eminent authors, it would hardly seem to be necessary to argue the necessity of early treatment of malocclusion and removal of all nasal and post-nasal obstructions to nasal respiration, thereby insuring development before the period of normal and rapid growth has passed away, together with the opportunity for the greatest benefit to the patient.

Already the orthodontist is becoming known as the "children's doctor," because he has been able to impress the great importance of "early intervention" in the treatment of malocclusion. He has another duty to perform in many cases besides the correction of malocclusion of the teeth and restoration of harmonious facial lines, and that is the reference of the patient who is suffering from nasal stenosis, the mouth-breather, to the rhinologist, for treatment of such nasal or post-nasal conditions as may be discovered in the diagnosis.

It is my firm belief that irreparable damage is done by the oft repeated advice to "Wait until the permanent teeth are all erupted before beginning operations for corrections of malocclusion," and even greater damage may be done by the neglect to observe the early symptoms of nasal obstruction and the immediate placing of the patient in the hands of a competent rhinologist for operative treatment. Deformed arches of teeth and disfigured features become confirmed in their abnormality after a long period of abnormal development, and neither the local tissues nor the general system will respond to remedial measures to anything like the degree that they would had they been operated on at an early age.

Fig. 24.



—*Grünwald.*

Figs. 25 and 26 represent the dental arches of the small boy represented in Fig. 6 as a mouth-breather, and who later, at the age of seven, was brought to me for treatment.

A diagnosis of the malocclusion revealed the mesial occlusion of the teeth as seen in Fig. 25, and the restoration of the normal mesio-distal relationship of the arches resulted in the change of occlusion noted in the casts on the right, Fig. 26. The correction was all performed upon the deciduous teeth, the retention being secured in the same manner as if it had been on the permanent teeth.

Fig. 25.

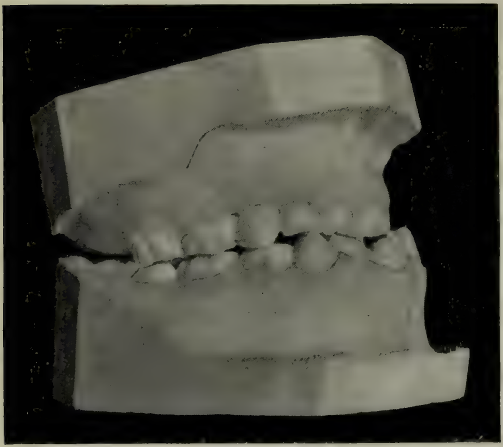
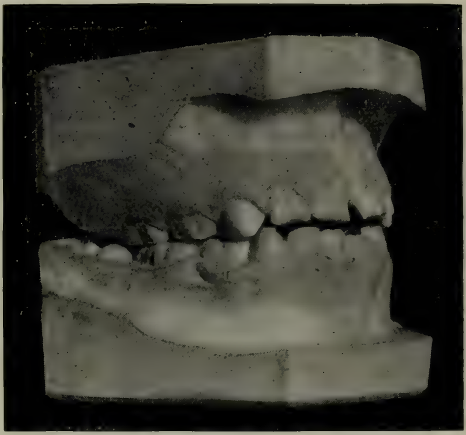
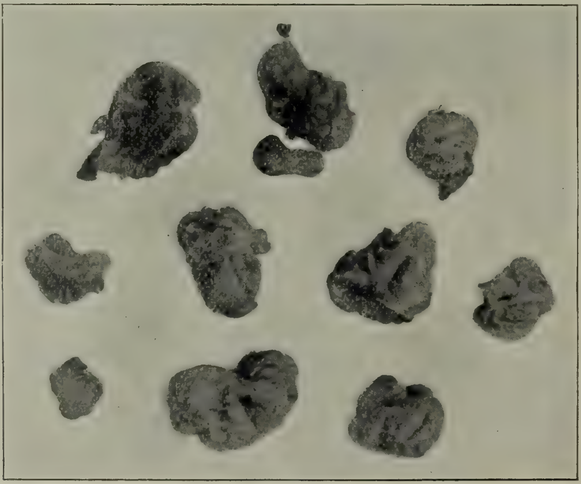


Fig. 26.



to assist him in the removal of the tonsillar and adenoid tissues which were found to be the cause of the mouth-breathing. The large amount of this tissue removed may be judged from the specimens saved from the operation, and shown in Fig. 27.

Fig. 27.



During the first few weeks of treatment I succeeded in getting the family physician interested in the case, and he referred it to Dr. Sanders, who invited me to the hospital, fitted me out with a surgeon's apron, and asked me

I would ask you to note particularly the great change in the appearance of the boy from the mouth-breather, in the next illustration (Fig. 28), with his features all distorted from the efforts to breathe through his mouth, to the calm, peaceful facial lines of the same boy after the removal of these obstructing growths and correction of malocclusion of the teeth (Fig 29).

The profile view in Figs. 30 and 31 shows the improvement in the facial contour as the result of correction of the malocclusion to marked advantage. The development of this face along normal lines of growth is now assured, and we can feel that we have left nothing undone to insure the very best results in restoration of facial harmony and normal respiration, and consequently the attainment of proper physical development, which in this case was already deficient.

FIG. 28.

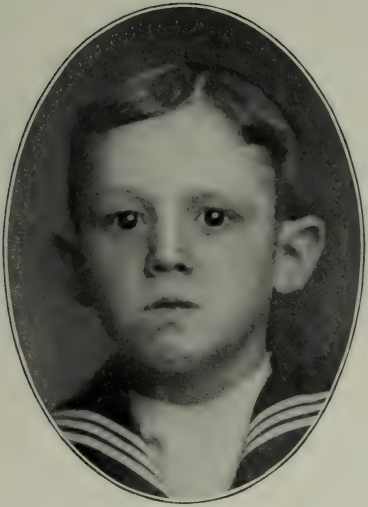


FIG. 29.

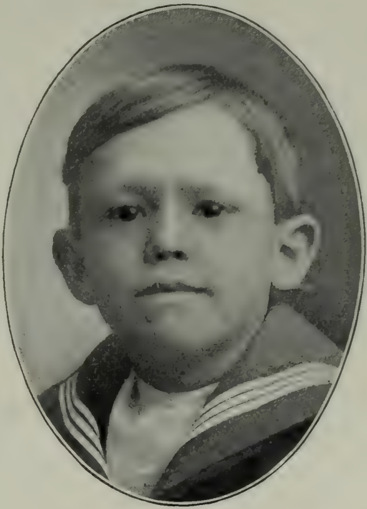


FIG. 30.

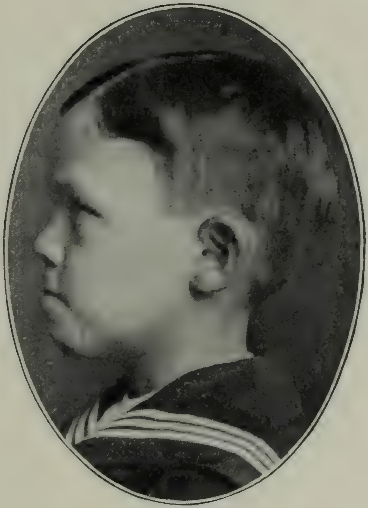
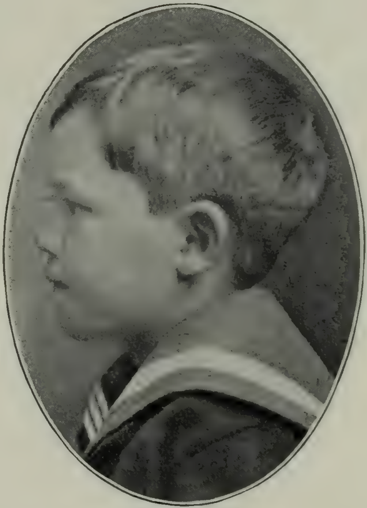


FIG. 31.

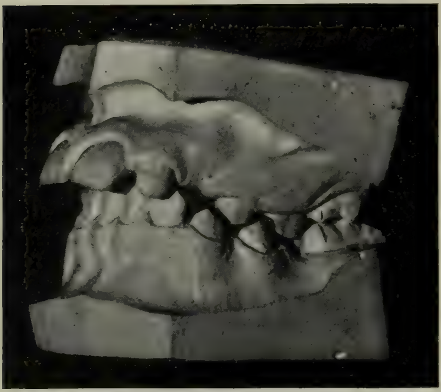


Figs. 32 and 33 illustrate the casts of another mouth-breather eleven years of age, the corrected casts (Fig. 33) showing the possibilities of occlusal restoration.

In the case illustrated in Figs. 34 and

35, the improvement in the facial profile is much more marked than in the previous case, and illustrates in the extreme what a priceless boon to humanity is the beneficent science of orthodontia.

FIG. 32.



Mechanical assistance in holding the mouth closed after removal of nasal obstructions and correction of malocclusion —such as the wearing of a head bandage part of the time—is beneficial in the treatment, and helps to correct the habit of holding the mouth open in these cases.

FIG. 33.

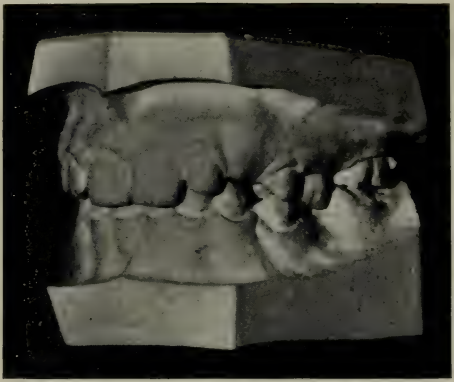


FIG. 34.

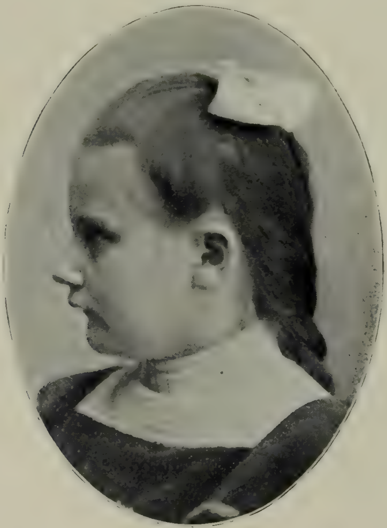
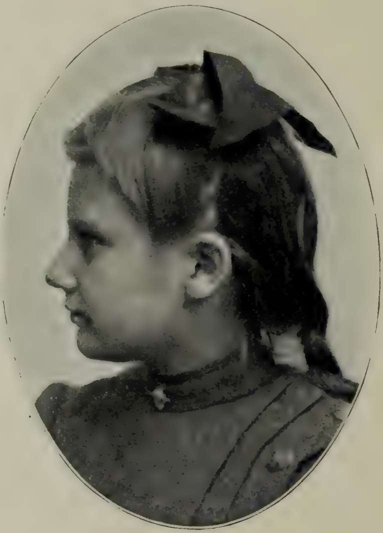


FIG. 35.



The head contains the portals of the human body, and we should consider it our duty to guard against any ill effects to the health through neglect of the oral cavity, its teeth, and related structures of nose and throat. Mouth-breathing, especially, should be prevented by such means as are at our command, by the aid of the rhinologist, and the correction of such resulting defects in occlusion of the teeth and inharmony of the facial lines as may be necessary at the time the case presents with the symptoms of nasal stenosis.

CONSIDERATION OF EVIDENCE IN SCIENTIFIC INVESTIGATION.

By G. V. BLACK, M.D., D.D.S., Sc.D., LL.D., Chicago, Ill.

(Read before the Dental Society of the State of New York, at its annual meeting, Albany, N. Y., May 11, 1906.)

IT is very difficult indeed to define what should be regarded as conclusive evidence in the formation of concepts* of the results of scientific work. Every subject-matter submitted to investigation in the past seems to have had set for it certain lines of evidence independently of general observations on other subjects, and to get a full view of what has been considered conclusive evidence upon which men have formed concepts reducible to practice, would require a very extensive examination of the history of the development of the sciences. In any event, the final decision is left to the body of men interested in the particular class of investigation.

In such a review, one finds that the rules of procedure necessary to the establishment of concepts reducible to practice and regarded as right differ continually as the years go by, and then concepts that have long served in practice and are believed to be correct are broken and displaced by the discovery of new truth, which after a struggle has shown the first to have been the result of a wrong interpretation of phenomena. The science of the first decade of the nineteenth century was not the science of the third decade, and the science of the fifth again was different from the third, and so on to the end of the century; hence, conceptions of the basic facts of science are continually differing, and the formulation of the science differs continually with these conceptions. There is perhaps as much difference in the evidence required by men as to facts in science, particularly new facts, as there is in their conceptions of the formulation of the science under which they work. Even the arithmetic of my boyhood has been almost completely changed in its forms, and in many instances in the characters used, although this is one of the most permanent of the sciences. Chemistry has changed its formulary, though the facts in chemistry are not different from the facts in my boyhood, excepting the fewer number that have been added since.

As it has been with these, the more permanent of the sciences, it has been with others of this class; but what shall we say of those that have been developing, indeed have sprung into existence —in this time!

CONCEPTS OF BACTERIOLOGY: FERMENTATIONS AND PUTREFACTIONS.

Perhaps there is no better field in which to study the extreme exactions of men as to the evidence required to change their conception of the basic facts in science than has been manifested in the study of bacteriology. This may be said to have begun with the publication of Schwann in 1838. This was in its beginning an investigation of the fermentations and putrefactions. Up to the time of Schwann, the best concept of what we now know as fermentations and putrefactions was that expressed more fully a little later by Justus Liebig in papers published in 1840–42. He states his concept as follows:

"Fermentation is the result of the

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*In this paper the word *concept* will be used as representing the product of a rational belief or judgment.

catalytic action of a decomposing body in contact with compounds of feeble molecular affinity, which is brought about in accordance with the following law of dynamics: A molecule set in motion by any power can impart its own motion to another molecule with which it may be in contact."

He argued that yeast is a product of the decomposition of gluten, and is necessarily a decomposing body whose molecules are in a state of molecular motion, and which, when added to must or wort, sets up in these bodies a molecular motion of their molecules similar to its own, by which its saccharin elements are converted into the simpler and more stable compounds, carbonic acid and alcohol. This may be said to be the simplest and most comprehensive definition of the concept of scientific men of the fermentative process up to that time. It was generally conceded that oxygen was necessary to this process and had the power to set it in motion, for it had been found that substances exposed to heat and sealed up while hot would not undergo putrefactive or fermentative decomposition. Now, Schwann in his microscopic studies of the alcoholic fermentative processes, had found them continually accompanied by globules, which he termed the yeast plant, and that these globules grew and multiplied by a process of budding which he could see and follow in his microscopic examinations; and further, he claimed that no production of alcohol occurred without the growth of these globules.

The evidence which he presented of this was that fermentable solutions that were boiled to destroy all life existing in them did not decompose when sealed; also that air might be admitted freely to such solutions through red-hot tubes, or through tubes with bulbs so arranged that the air would have to pass through sulfuric acid, and no decomposition would occur. In this way he admitted oxygen freely without inducing fermentation or other form of decomposition, but the addition of the yeast globules would set up fermentation at once.

Liebig in his papers to the British Association for the Advancement of Science, in 1840–42, made distinctly the claim that Schwann's proof was no proof at all of the vitality of yeast, for by the use of sulfuric acid through which he passed the air, or by the use of red-hot tubes, he would destroy the decomposing particles which might pass with the atmosphere; or that the decomposing body might be a gaseous body, the action of which would be destroyed in the same way as the particles of decomposing matter. It was well known at that time that the heat of boiling water destroyed ferments. Furthermore, the oxygen itself might be so changed in these ways as not to have its ordinary action on fermentable solutions. Now here is a case in which Schwann had seemed to have presented uncontrovertible evidence of the truth of the concept which he proclaimed. Liebig's argument completely destroyed the whole fabric of Schwann's concept so carefully worked out.

From this time on the battle between the vitalists on the one side, and the chemists on the other, over the processes of putrefaction and fermentation went on steadily; for a time a few men siding with the vitalists and the masses of men siding with the chemists, each continually endeavoring to bring new facts to bear in proof of the positions which they believed correct.

PASTEUR.

In the meantime Pasteur of France sprung into prominence in these matters because of the success he had achieved in the study of a disease of the silk worms of France, which was threatening to destroy the silk culture of that country. In this study he discovered that the disease was caused by a small germ or mold which grew in the worms, produced by the contamination of the eggs laid by the moth. By giving directions, which were very simple, for the prevention of this contamination, he saved the silk industry of France, and was immediately put in a position in which he could study such subjects to the best advantage that the science of the time would allow. He immediately undertook the study of the fermentations particularly. By his wonderful system of fractional cultures he determined that none of the fermentations could occur without the presence of living plants, and that each was produced by a particular species of plant that was different from those producing other fermentations. But again, it was quickly shown that Pasteur's fractional cultures were always produced by transferring some portions of a previous decomposing body to his solutions, and that he did not succeed in protecting his solutions from possible contamination with decomposing bodies and molecular motions described by the chemists. It was still held that the micro-organisms seen were mere accompaniments of these processes, and in no way their cause.

A point of signal importance was scored by Schroeder in 1854, when instead of sealing his solutions, as had been the habit of investigators before him, he simply stopped an ordinary test tube with sterilized cotton and demonstrated that such a stopping, which would allow air to pass freely but would filter out all particles of solid matter, was equal to hermetical sealing in its power to prevent decomposition occurring in fermentable or decomposable solutions. This at once destroyed Liebig's idea of the action of oxygen and of a gaseous agent of decomposition, but it did not destroy his idea of solid particles floating in the air in the dry state that were able to renew their molecular motions and set up processes of fermentation upon again being moistened, for these would also be excluded by Schroeder's cotton filter, the same as would any other solid particles.

Though two of the concepts of the chemists had been demolished, the contention went on. In was in vain that the vitalists demonstrated the presence of organic germs in each of the fermentations and decompositions; that they demonstrated that each would fail unless it had growing within it the particular form of germ that they had found to produce that particular fermentation or decomposition. Still the old idea of molecular motion accompanying them was a bar to any general reception of their ideas by the educated public mind.

LISTER'S INVESTIGATIONS.

At this time a new interest was injected into the study, and its direction changed into medical lines by what I have always felt was a happy accident. In 1865 Mr. Lister, a surgeon of Glasgow, became interested in following the contention between the vitalists on the one hand and the chemists on the other. At that time, the fact that the large hospitals had become places of danger rather than of safety to surgical patients had given the idea to our best medical men that either living germs or the molecular motion decompositions were possibly responsible for the infection of wounds causing the evil results, and were anxiously looking for some remedy that would make the large hospitals safer for operative wounds. It had also been found that there were in the pus from wounds of surgical patients similar, if not identical, micro-organisms with some of those of the decomposition. It was these considerations that impelled Mr. Lister to make the following remarkable experiment for a number of patients, one after another, for whom he was making deliberate surgical operations:

He prepared by the most thorough cleansing his own hands and instruments, and the skin of the patient in the region to be operated upon, and then attempted to purify the atmosphere in which he operated by a spray of carbolic acid, which was then known to be destructive to the agents of fermentation or putrefaction; and afterward so sealed the wound with sterilized cotton and bandages as to prevent the ingress of particulate substances. To his own surprise, and to the astonishment of the medical profession, no suppuration occurred in any of these wounds, but each healed by first intention the same as subcutaneous wounds.

The plans adopted by Mr. Lister in this treatment of wounds were so simple that surgeons everywhere tried them at once, and the results reported were so generally confirmed that they were immediately accepted as expressing a truth of vast importance to man. This gave a tremendous impulse to the study of these subjects, and swerved many men of science, whether justified or not, from the opinions of the chemists to the opinions of the vitalists. But the evidence was not sufficient in the opinion of the mass of scientific men to establish the facts claimed. True, suppuration could be prevented by the methods of Lister, which were rapidly simplified, but still the molecular hypothesis held firmly to its ground; it had not been destroyed—and again there were long years of labor with indifferent results. Even such men as Thiersch and Billroth, while accepting the methods of Lister and obtaining similar results, still claimed that they found these so-called micro-organisms in the blood of healthy persons, and that it was not the effect of these growths, but the effect of decomposing bodies, that was shut out.

KOCH'S WORK.

Again there was a long series of experiments by the vitalists for further results that could be regarded as more conclusive. This time Dr. Koch was the lucky man. He developed the process of selective staining by anilin dyes, by which micro-organisms in the tissues could be stained while the tissues remained clear. As this was tried and found decisive in its results, it was proved by this means that the granules in the blood of healthy persons regarded as micro-organisms by Thiersch, Billroth, and others, were not micro-organisms, and established the fact that it was only occasionally that micro-organisms were found in the blood of healthy men, and these very few in number. This was followed quickly by the discovery, again by Dr. Koch, of the processes of cultivation upon semi-solid media, in which every movement of the micro-organisms could be watched during their growth; a plan by which these could be studied without inciting fermentation or decomposition in the substratum on which they grew. By these methods individual species of micro-organisms could be certainly separated from other species, and watched from generation to generation as they were transferred from culture to culture, without any of the usual signs of decomposition accompanying them.

True, these growths were small, very much limited, but when the micro-organisms thus grown were again transferred to fermentable solutions the decomposition appropriate to each micro-organism followed with certainty. This, as it was put into practice by many men, furnished practically the necessary proof of the influence of micro-organisms in the fermentations and putrefactions, and finally gave the last test necessary to prove their connection with the production of disease. This could not be said to have been completed until between the years 1880 and 1884, and even at that time was held in doubt by very many scientific men. It would be difficult perhaps to find another parallel to this series of investigations in their results upon men, and perhaps no others have been beset with such tremendous difficulties. There are few investigations of great importance, however, that have not passed through some similar course.

THE CIRCULAR MOTION OF STORMS.

Take, for instance, one that may by many be considered one of the lesser investigations in its results upon men, the studies that have been made in meteorology, in which I have had a very strong personal interest. For a long time Mr. Redman labored at this subject practically alone, developing his concept of the circular motion of storms, facing the opposition of the whole body of scientific men. Finally his writings attracted the attention of Fitzroy of England, a man well versed in science, who had retired from the navy with abundant means at his command. Through his lifetime of experience on the ocean he had formed notions different from Redman's concept of the circular motion of storms; but he undertook to find new proof of the older concept that storms of the larger sort were universally straight blows. For this purpose he established stations for weather observations over England and a large part of the Continent, and obtained daily telegraphic reports for a considerable time. To his astonishment the result was the confirmation of Redman's concept of the circular motion and eastern travel of storms. While his experiments were undertaken with the avowed purpose of refuting, they gave a very strong impulse toward establishing Redman's concept in the minds of scientific men.

This matter was now taken up by the Smithsonian Institute at Washington, and the subject pushed against serious opposition and difficulty until the time of the great war of the Rebellion. During that war General Meyer, sitting in his office at the Smithsonian Institute, regularly telegraphed to the generals of the Union army the weather conditions they might expect the next day. This gave an advantage to our generals, and was such a boon to our soldiers in the field, that at the close of the war Congress was impelled to erect this into a department for the benefit of commerce and agriculture, as its importance deserved, with General Meyer as its chief. But I am sorry to see that since General Meyer's death it has been banded about in a way not complimentary to our government, and not calculated to promote a development in that study suited to bring the best good to humanity. But as an example of the development of a valuable concept of phenomena under serious difficulties displacing one previously held, it stands out in my mind as very important.

INVESTIGATORS IN THE DENTAL SPHERE.

I have cited these occurrences as examples of the exactions required in the evidence for the refutation of any concept of truth that has been common among learned men. I might mention many more, for a large number of lines of research have been carried over to their fruition within the last century. One of these, the doctrine of evolution, has been particularly beset with denials and difficulties of proof. There are in our own professional lines of work many cases of a lesser sort, but of the same nature so far as requirement of evidence is concerned. Miller's work on caries of the teeth was very slowly received, so slowly that for some years I doubted whether the dental profession would grasp the whole truth as Miller had worked it out. The benefits of the use of the rubber dam introduced by Barnum were very slow of realization. On the other hand there are many concepts springing up that seem incapable of bearing fruit because of lack of merit. While it seems to me certain that valuable truth may not long be buried by opposition, we hate to think of the possibility that sometimes its results may be permanently destroyed. Yet such a contention should be made for a concept that has seemed to serve well, as to prevent the general adoption of a new one radically different without the most thorough demonstration of its correctness and fitness. This is certainly healthful in its results.

Undoubtedly many of the concepts of phenomena proposed by zealous experimenters should pass into oblivion because derived from false premises, or by reason of their unfitness. Some years ago, Dr. Arthur, in the study of injuries of the teeth by dental caries, proposed and developed what became known as the Arthur method, which the older men among us still remember, of separating teeth in the treatment of approximal surfaces. Many men tried this method, found it wanting, and it quietly passed into oblivion. It is practically buried in the books and journals of the past. This was not because it did not have in it some valuable truth, but rather because it was not fitted for the permanent exemplification of that truth. Most of us will remember the craze caused by the concept, cataphoresis as a pain obtunder, and how it passed, leaving the manufacturers with whole rooms full of junk. This was not because this concept did not contain elements of truth—*i.e.* cocain can be carried into dentin, not otherwise injectible, by the electric current—but rather because its rightful instrumental application was found too difficult for the masses of men. It was unfit.

In all of this consideration there should be a careful distinction between a concept derived from the study of associated natural phenomena and a mere mechanical device. We have so much to do with that which is purely mechanical that we are too liable to confuse the two. In fact, the usefulness of an apparently valuable concept may depend upon an instrumental appliance, and become unfit because of imperfect instrumentation.

Some of you will remember that under the influence of Dr. Carl Heitzman a new proposition—or an old proposition under a new form—was sprung which practically denied the cell theory, and with this were proposed new theories as to the structure of the human teeth, the inflammatory theory of dental caries, and more of the same order. This flourished for a time among those more closely identified with this man and his immediate circle of friends, filling books and journals with much matter, and influencing the minds of quite a large number of practitioners. This has passed, as an hypothesis unproved and unfit to explain the phenomenon it endeavored to elucidate.

The concept that some teeth are soft or poorly calcified, while others are hard and contain a greater proportion of calcium salts or are well calcified, grew up in the dental profession through the observation that the teeth of some persons decay very rapidly, while the teeth of others decay very slowly, or not at all. This occurred without any individual being responsible for it, so far as I can read the history of its development. But it became the settled conviction of nearly all men, not only in the dental profession, but of the laity as well. This is now being replaced by a concept that is different, and undoubtedly better fitted for the welfare of the communities which we serve. Thus far this has stood the test of criticism. But the change of sentiment is not easily made. Many good men are very slow to give up a concept which they have held from their boyhood. This is well, for again I may say that no concept of phenomena which has been widely held among men should be given up without that contention which demands the most positive proof of the correctness and the fitness of the new concept which shall take its place.

AMALGAM IN DENTISTRY.

Not many years ago the "new departure" sprung into prominence. It had for its object the displacement of gold and the substituting of amalgam (plastics) for filling teeth. It proceeded on the hypothesis that in proportion as teeth need saving, gold is the worst material with which to fill them. Nowadays we do not hear of that, though hundreds of men in the dental profession were influenced by that claim to do things which they would not now repeat, because they have learned that it is not good for the people whom they serve.

What shall we say of that oft-discussed subject, the amalgam controversy? In the past amalgam was certainly the most hated material ever used by dentists, yet its use has grown until it has become almost universal in dentistry. I have been personally responsible for the most recent studies of the properties of this material, and found a basis, before unknown, by which it can be rendered far more useful to the people whom we serve. Of this the most abundant proof seems to have been presented, and this presentation has thus far seemed to stand the test of all adverse criticism. The general adoption of this is attended by several very unusual difficulties. There is no way by which the dentist can tell the good from the bad for himself except by close observation of years of trial, and men can impose upon him alloys unfit for use. The habit manufacturers have of holding formulæ and plans of making alloys secret has become a bar to progress. Indeed they are making their alloys virtually secret remedies. The physician will not prescribe a proprietary drug until he has been furnished its ingredients and mode of preparation. Should the dentist be less exacting? Certainly he should know as thoroughly what he uses in the mouth in the treatment of caries of the teeth as does the physician who prescribes drugs know their formulæ. It is properly the business of the manufacturer to furnish that which the dentist needs in the forms for his use, and when this is demanded by any considerable portion of the dental profession, it can be obtained, and will be furnished cheerfully.

Let me inquire what is the duty of our profession in a case like this. It seems to me that it is the duty of men of scientific turn to test such a case to the fullest necessary extent, and to provide some public means by which a dentist may know whether or not the alloy he uses is so made as to produce the best results reasonably obtainable commercially. There is no necessity for any unreasonable demands. Whenever alloy-makers know that their alloys will certainly be subjected to definite tests that are reasonable, a sufficient number will furnish alloys that will stand that test. There is no good reason why the dentist should use an alloy that will fall short of the full usefulness demanded of it.

CONCEPTS "ON TRIAL."

There are always with us a number of concepts or propositions that should be looked upon as on trial. One that has been prominent for a time is the use of porcelain for inlays. The use of porcelain in dentistry has had a very novel history. It has seemed to me that more men have gone crazy—speaking somewhat figuratively—on the subject of porcelain than on any other, for it has been with us many years. Men have made all-porcelain plates, and have combined porcelain with other materials in the strangest of ways, most of which have passed. But recently, with the development of the electric apparatus for its baking, porcelain has again come to the front, and its most zealous advocates are promising almost everything for porcelain, though it must as yet be considered as simply on trial. In certain selected places in crown and bridge work it has certainly found a lasting place in dentistry; but for the most part, and particularly for filling teeth, the saying should be, "It is as yet on trial," with pretty certain fields of usefulness being mapped out, but it will not probably be of universal application. As it is with this, so it should be with many of the new concepts that come to the front, and we as scientific men should always guard our expressions with extreme care, and know well whether or not they are good before we recommend their general adoption.

Still another is somnoform. This is a proprietary mixture for anesthetic purposes that is being pushed for gain, and many of our younger men are taking up this in the place of the long-tried nitrous oxid. Personally, I had a pretty long and careful trial of the drugs of which this mixture is composed when they were first brought to the notice of medical men. In association with other experimentalists, I gave them to animals and then to men. We watched their effects carefully for a time, and then laid them aside. Afterward I made a limited use of them in carefully selected cases. Generally careful men who made similar experiments dropped these drugs, and they did not come into general use. Many of the older men here will remember the A. C. E. mixture—alcohol, chloroform, and ether; for a time this was popular, but the final consensus of opinion was that such a mixture was no safer than its most dangerous ingredient, and it went out of use. In my opinion somnoform must do the same. I want to say to young men who are using it, that if they are so unfortunate as to have an accident they are liable to find scant sympathy before a court. The body of medical men have not yet recognized this as a suitable anesthetic.

In closing, may I inquire what is the duty of the general profession toward new things that are presented? We are professional men. Within our field of service we are the guardians of the interests and the well-being of the communities that we serve. Is it not our duty to inquire into new things or concepts that may be presented, and make such exactions as to the proof of their correctness as shall leave no reasonable doubt before recommending them? In some lines this is being well done, but is it not true that many things are being recommended for use with scant evidence of their correctness? At the same time we should not too severely judge those who run after this or that novelty, for by their endeavors the facts will be developed, and the usefulness or non-usefulness of such novelties will be made known. It becomes the duty of members of our profession to carefully examine all such things, and not pass them by with indifference, for if they prove good they should be developed. In the meantime great precaution should be had as to risks of injury to patients in the trial of new things.

CORRESPONDENCE.

ETHYL CHLORID AS AN ANESTHETIC: REMARKS ON DR. FRIEDLAND'S STATEMENTS.

To the Editor of the Dental Cosmos:

Sir,—In your issue for August 1906, in the article entitled "Shall We Abandon Nitrous Oxid for Ethyl Chlorid or Somnoform?" Dr. M. M. Friedland, the author of the same, wrongly attributes to me the statement which follows. He says, "Dr. Ware in conclusion states: 'As the patient had one year ago experienced an apoplectic stroke, perhaps due to embolism from the heart, it is possible that a recurrence of the attack may have been the cause of death, as ethyl chlorid is too quickly eliminated from the system. *No matter what caused the death directly, the indirect cause was, after all, ethyl chlorid.*' "

The statement in quotation marks is paraphrased, and its last sentence, which I have italicized, is original with Dr. Friedland.

Such misrepresentation is only a part of the meager proof that Dr. Friedland has brought forward to condemn ethyl chlorid. The death-rate—1 in 17,000—given by him, held good four years ago; today it is nearer 1 in 40,000, obtainable from the published cases. This mortality is midway between that of ether and that of nitrous oxid, and on the face of it entitles ethyl chlorid to serious consideration as a general anesthetic. It will not supplant nitrous oxid, but will usurp its place in many fields, and this, furthermore, for economic reasons as well as practical advantages.

Finally, I wish to call attention to the fact that the mortalities recorded have occurred at the hands of the inexperienced. In skilful hands the death-rate is a negligible factor, and when the administration of anesthetics shall become a specialty in dentistry, as has come to pass in surgery, the extraction of a tooth under ethyl chlorid may rise to the dignity of a major operation.

Yours sincerely,

Martin W. Ware, M.D.

New York, N. Y., September 4, 1906.

PROCEEDINGS OF SOCIETIES.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-eighth Annual Meeting.

FIRST DAY—*Morning Session.*

THE thirty-eighth annual meeting of the Dental Society of the State of New York was held in the assembly hall of the Hotel Ten Eyck, at Albany, N. Y., May 11 and 12, 1906.

The meeting was called to order Friday morning, May 10th, at 10 o'clock, by the president, Dr. W. J. Turner of Brooklyn.

Prayer was offered by Rev. Dr. Hamsley of Albany.

After some routine business had been transacted, Vice-president Dr. W. A. White took the chair while President Dr. W. J. Turner read his annual address.

The President having resumed the chair, the society listened to the reading of the report of the Committee on Fellowships, presented by the chairman, Dr. Wm. Jarvie.

PRESENTATION OF MEDALS.

The report was accepted, and the next order of business was the presentation of the Fellowship medals, in accordance with the recommendation of the report, to Dr. G. V. Black of Chicago, Dr. E. T. Darby of Philadelphia, and Dr. W. D. Miller of Berlin. The last-named gentleman was not present.

The President, in presenting the medals, spoke as follows:

Gentlemen of the Dental Society of the State of New York,—It is my privilege to congratulate the society on this happy occasion on the beginning of a new order of membership, that of Fellowship of the Dental Society of the State of New York. In suggesting the formation of these fellowships, your last president, Dr. William Jarvie, had in mind the ennobling character of the great scientific investigators in our profession, and the open-handed way in which they freely give of the results of their labors to the rest of us, adding to our intelligence and skill in practice. Dr. Jarvie also thought of those princes among men who for their ability, industry, lovable character, and sterling worth, have risen to the highest pinnacles in our profession, and are held in the greatest esteem and honor by the entire community, and endeavored to formulate a means by which we could show our appreciation to them. The result is witnessed today in the starting of this list of honor by the election to fellowship of Dr. G. V. Black of Chicago, Dr. W. D. Miller of Berlin—and of the United States soon, we hope—and of Dr. E. T. Darby of Philadelphia.

I am sure that we all feel that the committee appointed to suggest names for this election have made the happiest selection possible. In the entire list of great men in our profession today these three occupy positions among the very highest for scientific attainments and irreproachable character, and as thorough all-round gentlemen.

From this time but one will be elected to fellowship each year; and we believe and trust that a like good judgment will be displayed in further elections as has been demonstrated here today. If we may be permitted to look for a moment into the distant future, we see a long list of the names of the most eminent men which dentistry has produced; a list upon which it is an honor for any name to be inscribed, and a list the possession of which will shed untold glory upon the Dental Society of the State of New York.

To you, gentlemen, who are to head the list, I deem it a high privilege to be the medium through which is conveyed from the society to you these medals in token of our unbounded esteem.

Drs. Black and Darby in brief responses expressed their acknowledgment of the honor conferred upon them.

The next order of business was the reading of a paper by Dr. J. Q. BYRAM of Indianapolis, Ind., entitled "Some of the Phenomena of Colors in Porcelain Inlay Work."

[This paper was printed in full at page 929 of the September issue of the COSMOS.]

Discussion.

Dr. R. M. SANGER, East Orange, N. J. The problem which Dr. Byram has presented to us in his paper is one which has been in our minds ever since the introduction of porcelain as a filling material. The solution of this problem will evidently have to be worked out along the lines suggested by this excellent paper. To discuss it is a very difficult matter, as Dr. Byram has covered the ground so thoroughly, and while, in listening to the reading, I found some points to which I thought I would take exception, he has taken exception to them himself, however, and so has taken the wind out of my sails.

I have made some inlays in layers, and many of a single color, but my own experience in the building up of contours such as he has shown has been that I have obtained the best results by selecting a porcelain tooth that matched the one to be filled, cutting off the corner, and then baking it into the matrix. That does not solve the problem scientifically, but it does practically and quickly. The introduction of porcelain rods at one time seemed to solve the color problem in porcelain inlays, but unfortunately all cavities are not round, and some cannot be rounded at all, and so in that particular the rod system has failed.

I am reminded just now of a little piece of history in connection with this subject. A gentleman appeared in New York several years ago who claimed to have solved the problem of colors for inlay work. He organized a class, and the more advanced men of the profession were eager to learn his secret—which was that he selected a piece of porcelain tooth of the desired color, crushed it up and re-baked it, claiming thereby to obtain exactly the color wanted. But unfortunately for his theory, the pieces of the porcelain tooth were not of a single color, and consequently when crushed and re-baked did not produce the color that had been produced by the manufacturer. I speak of this in passing, to show how eager we are to solve this very perplexing question.

My attention has been called to a system of underlaying the inlay with zinc oxid, and fusing a little porcelain over it, which gives a granular opaque base, and consequently acts as a reflector in the same way that Dr. Byram describes the use of white cement. I have found in my practice, following the suggestion of Dr. Byram, that for most inlays—especially labial inlays—the white cement gave the most satisfaction. Perhaps I did not solve the problem as successfully as he has, but I am glad to know why that is a fact. The difficulty, as he says, arises from the inability to obtain a white cement, and I have had recourse to a layer of white porcelain in the base of the matrix before baking the color over it. This seemed in some instances to solve the problem happily, but in others it did not. Of course we have to recognize the fact that every case calls for its own individual treatment. I think a careful study of the essayist's paper in detail will enable us to better solve the problem.

Dr. C. F. ASH, Brooklyn, N. Y. I have enjoyed the paper very much, and the point that impressed itself upon my mind more particularly was that after all is said and done, it seems that the color problem in inlay work resolves itself into the question of cements. Almost every man who has made an effort to make inlays of porcelain has been very much pleased with the result of his effort as shown after peeling off the matrix, and placing the inlay in the tooth. But unfortunately, when the cement is applied and the inlay is set permanently its color changes, for the rays of light being broken up, some are absorbed and some are reflected through the porcelain, instead of being absorbed as was the case before the inlay was cemented, thus causing a different effect. If we had to do only with porcelain, a translucent body, we could do away with the discussion of the transmission and absorption of the light rays by opaque substances. But the fact that we are compelled to deal with an opaque substance in setting the inlays changes the complexion of the discussion of inlays entirely. If we could secure a translucent cement, I think all the cement workers agree that the problem of color would be speedily solved.

Another common source of failure is, I think, sometimes due to inexperience on the part of the inlay worker in not properly preparing the cavities. What I have in mind is the illustration which Dr. Byram showed in the piece of amber glass, where the thickness of the glass increased the density of the color, or the intensity of the color, if you please. That phenomenon is general, and is responsible for some of the mistakes and difficulties which we encounter in inserting inlays. If you have ever noticed a stained glass window in which figures are portrayed wearing different colored robes, purple for instance, you will notice that the various shades of purple are produced by the different thicknesses of the glass, and not by a change in the proportion of pigments, and that will illustrate what I mean by saying that mistakes are sometimes made in the preparation of cavities. For instance, in a cavity of this kind [illustrating], if the porcelain worker is not careful that the edge at the labial surface is almost at right angles to the labial surface, he will find that the thickness of the porcelain must necessarily vary, and the thinnest portion of the porcelain will be next to the portion of the tooth that you want to match. Now, in selecting the color for the inlay, you naturally select the color which will match the body of the tooth, and therefore when the inlay is finished and placed in the tooth before cementing it, it will match most beautifully; however, after it is cemented in, the thinnest portion of the porcelain—the very part most important to match accurately—will be next to the tooth, and its color will be changed by the cement showing through, and the color of the inlay is of course also changed at that point, although it may be more nearly perfect at the outer side. If this condition of things could be reversed so as to obtain the best match near the point of contact at the labial surface of the tooth, and have it shade away to the other side, you would have a more natural inlay, but the reverse is usually the case. The patient frequently returns to the office very much distressed a few days after having had the inlay in the mouth. When the patient went home she probably said to her husband, "Look at this beautiful filling that the doctor put in for me." He looks at it, and says it looks like a piece of putty. She looks at it, sees the difference, and says, "Why, when I looked at it in the office, it looked beautiful, and I complimented the doctor; it must have changed color." Of course we understand that the cause is due to the difference in the intensity of daylight and artificial light.

An additional difficulty in this work arises from the fact that the inlay worker does not lay enough stress upon the study of color formation. It is unfortunate that but few of the men who are working in porcelain study color phenomena. I venture the assertion that if Dr. Byram were to pick out ten men at random, mention any two colors that might come to his mind, and ask what color is formed by their combination, sixty per cent. of them would fail to give the correct answer. I think most porcelain workers if asked offhand would not be able to give the correct answer. I think I am right in this assertion, because I have made the test in talking with different men of asking what two colors entered into the formation of a certain other color. The answer is that they have been out of school so long that they have forgotten that.

Another trouble in producing the proper shade in an inlay is frequently due to the fact that the porcelain powder in being applied to the matrix is mixed so very thin that when shaken down it will be found in some of the porcelains that the pigments are so indifferently incorporated that they will drop to the bottom of the inlay; and after baking and pulling away the matrix, the color on the labial surface is lighter than that on the bottom, because the pigments have dropped to the bottom of the cavity.

Now, one more trouble that we experience in setting inlays. Of course the color that we have most to do with is yellow. There are more yellow inlays than any other, and a mistake frequently made is that in setting a yellow inlay, the inlay worker will use cement which borders on blue, or in setting a blue inlay, he will frequently use a cement that borders on yellow; and this results almost invariably in an inlay of greenish opaque appearance, because the light in passing through the blue porcelain will lose the colors, red, orange, and yellow, which are absorbed by the blue; the green, violet, and blue are transmitted on to the yellow, which will absorb the blue and violet rays; and the green rays, which are not absorbed, will change the color of the inlay from blue into green.

Dr R. H. Hofheinz, Rochester, N. Y. I think it was Newton who gave the world the first scientific information on colors. Goethe spent some of his life trying to contradict all that Newton had said, but we had to wait until 1906 to get the best dental essay on colors that I have ever heard.

The color problem is certainly one of the most important in connection with porcelain inlays. In closing his paper Dr. Byram made the remark that he was very much grieved over the fact that so few dentists are using porcelain. I believe that this very complex and perplexing question of color is one of the main reasons why this is the case. After a man has spent a number of hours in making an inlay, and finds when it is finished that it does not correspond with the color of the tooth, he becomes decidedly discouraged, and turns his attention to gold. The patients know the color of gold; they know it is yellow, and some of them would like it more yellow than the gold naturally is.

I do not quite agree with Dr. Ash when he says that the main problem in the coloring of inlays depends on the cement. Is that right, Dr. Ash?

Dr. Ash. Yes sir.

Dr. Hofheinz. I do not think that is correct with all inlays. It is correct in its application to small labial and approximal inlays, but in the contour work the cementation itself is of minor importance. I have always believed—as Dr. Byram says—that a uniform cement should be sed as much as possible, and if a translucent cement were to be given to the profession I believe with Dr. Ash, that a considerable portion of the problem would be solved. Owing to the fact that we cannot obtain an entirely white cement, I have resorted to the whitest yellow I can get, because it reflects light more than any other color.

Dr. Ash spoke in regard to the inlay that looks well in the office and not well at home. He spoke of the artificial and natural light. There is another factor to be considered, and that is the question of the angle at which the inlay is inspected. It is just the same difficulty as was encountered in olden times with artificial teeth. A person viewing a set of teeth from the right side would say that it was beautiful, while a person looking at it from the left side might say that it did not look at all like the natural set of teeth. On one side there may have been a reflection of light, and on the other absorption. This is an important point in connection with the color problem of inlays.

The question of thickness which has been so much emphasized is, I think, one of the greatest importance. I do not see how anyone can obtain a correct color where the thickness of the inlay is one-half a millimeter and polychromatic. If the different conditions which Dr. Byram has outlined to us are not taken into consideration in perfecting the color problem, inlay work remains very unsatisfactory from the esthetic viewpoint.

Dr. JOHN I. HART, New York. The difficulty which we have met of matching the porcelain with a suitable color of cement has very properly been dwelt upon, but I can state that an oxyphosphate has been placed on the market by the agents of the Jenkins porcelain which absolutely matches the porcelain. For instance, if you are making use of the Jenkins body No. 4, you have by this method an oxyphosphate of a definite number, which when mixed with a bone or ivory spatula will match that porcelain. How lasting it will be I am not prepared to say, because I have only been using it for about four or five weeks, but it matches the color, and it becomes as distinctly hard when mixed and kept dry for fifteen minutes as any zinc oxyphosphate that I have used; and if it will last permanently it will help us considerably in the solution of the color problem in porcelain inlays.

Dr. A. C. RICH, Saratoga Springs, N. Y. One point it seems to me has not been touched upon, and that is the formation of the cavity as applied to Dr. Byram's theory of density. I think a great many of our porcelain workers today are inclined to save tooth-structure to the detriment of the beauty of the porcelain inlay. The edge of the cavity is made so thin—because the operator does not wish to cut away the tooth-substance—that a beautiful filling is destroyed when finished. A great deal is dependent on the formation of that cavity, in making it so that it will retain the filling after being made, and give it the proper degree of density or uniformity of density.

Dr. BYRAM (closing the discussion). A few weeks ago I had the pleasure of giving a lecture before one of the western societies on this subject, and after I had finished, one gentleman in his criticism went on to say that I had not taken up all the phenomena that bear on the color problem in inlay work, and went into the discussion of refraction and polarization of light. I replied by saying that I had troubles enough of my own to try to work out the problems that seemed to be most important; and I am very glad that no one has attacked me on that point here.

I can assure you that it is a very great pleasure to experiment with colors. I believe Dr. Ash was right when he said if you asked a majority of men what colors are formed by certain combinations, they would be unable to answer offhand. I want to offer you one or two suggestions in connection with this subject that have been a great help to me. I have an outfit of water colors containing the primary colors—red, yellow, and blue. I spend a portion of my Sunday afternoons playing with my children, and at the same time dabbling with these colors. It is instructive to me, and it amuses the children. I believe those who are doing porcelain work or expect to take up this subject need to make a thorough study of some of the phenomena of color formation. If you will get a few pieces of stained glass and an outfit of water colors, having the three primary colors—red, yellow, and blue—and work with them, making the different combinations, it will be very interesting as well as very instructive. You may not believe it when I tell you that it took me two hours to work out what I consider black, made from red, yellow, and blue. I keep a few pieces of colored glass around the office, and study them in the different lights by simply looking through them. I do this in order to train the eye to assist me in remembering the colors. I wish to call your attention to the necessity of training the eye to detect delicate shades. One is liable to look at the tooth in its entirety, and say that the tooth as a whole is light blue or light yellow. We should study the tooth in sections. Color, you must remember, is the sensation produced on the optic nerve. One may look at a tooth in its entirety, and the color of the different sections may affect the retina differently and confuse the optic nerve so that the delicate tints are not detected. I never study a tooth in its entirety, but study it in sections. Exclude everything but the incisal edge and study that area; then exclude all but the middle third and study that section; then study the tooth in its entirety, and I assure you that it makes quite a different impression on the retina than if the tooth were studied as a whole first. Dr. Sanger speaks of grinding fused porcelain for the corners of certain inlays, and especially those in the incisal region. Now that method may be good in his hands, but I consider it in my hands a poor one. I believe he could do better by using porcelains in the form of powders.

I wish to join with Dr. Hofheinz in criticizing Dr. Ash in the one point that probably the greatest problem is in the cement. I agree that it is the main problem in labial cavities, but I will say that the labial cavities are few. Five years ago I taught that the principal indication for porcelain was on the labial surfaces of incisors and canines. Today I am teaching that as the size of the cavity increases on the labial surface of incisors and canines, in that proportion is its indication for an inlay increased. We say these cavities are conspicuous and must be filled with porcelain. If gold be used, and is conspicuous in these small cavities, how much more conspicuous will it be in the larger ones? In the smaller cavities the cement is more of a problem than in the larger ones. In this form of cavity the inlay is a comparatively thin layer of porcelain, and it is almost impossible to make the inlay thick enough to decrease the translucency as much as desired. He spoke of the white lining. This is a good plan if the cavity is deep enough to allow of a thick layer being used. It carries out the theory that white reflects better than any of the colors. It does not absorb light, consequently the same rays are reflected that are transmitted. and for that reason the inlay remains of the same color after cementing it. The trouble with the white lining is that if you place it in a thick enough layer to get the desired effect, you will not get the proper effect in the overlying colors. Or if you etch the inlay, you are liable to cut through the lining, and practically destroy the effect desired.

I am glad that Dr. Ash spoke of the preparation of cavities, because it is a very important point, but it was not the purpose of the paper to go into cavity preparation.

I would suggest to Dr. Ash that he discontinue showing his inlays before they are set. I learned better than that quite a while ago. Wait until they are set, and then show them to the patient.

Dr. Ash. I have not shown an inlay to a patient before setting it for over eight years. I wanted simply to call attention to the fact that that is one of the mistakes frequently made by some dentists.

Dr. Byram. I misunderstood the speaker. Now to go back to the cement problem again for a moment, and in replying to Dr. Hart. I have been experimenting with the new cement he speaks of, but if he can mix that cement so that it gives the same color as the porcelain, he is more successful than I am, or the effect produced on his retina and mine is different.

Dr. Hart. What kind of a spatula do you use?

Dr. Byram. Platinum.

Dr. Hart. If you will try the bone or ivory spatula, I think you will obtain better results.

Dr. Byram. I have not tried the bone or ivory spatula with this cement. However, that is not the point. In labial cavities that cement can be used to advantage. If you set the monochromatic inlay with a cement of the same color as the porcelain, then the light passing through the inlay to the cement will be reflected. There is no absorption, at least theoretically, and for that reason there is no change of color, but if a cement is used for setting multi-chromatic inlays which absorbs a certain amount of the color, the appearance of the inlay will be changed. If Dr. Hart constructed an inlay with the multi-chromatic porcelain—and I believe he does—I do not see how he can find any colored cement suitable for setting approximo-incisal inlays.

FIRST DAY—*Afternoon Session.*

The meeting was called to order by the president, Dr. Turner, at 2 o'clock.

The first order of business was the reading of the report of the Committee on Scientific Research, by Dr. F. W. Low, Buffalo, chairman, as follows:

REPORT OF THE COMMITTEE ON SCIENTIFIC RESEARCH.

Mr. President and gentlemen: Last year your Committee on Scientific Research gave first consideration to the "Amalgam Question." This year we shall reverse that order, making our plunge first into the maelstrom of "that slippery slimy sea" the depth of whose iniquity no plummet yet has sounded. When we emerge, if you still survive, we will undertake to weigh the dangerously double-loaded problem of "Dental Alloys."

CONCERNING THE SALIVA.

When it is remembered that approximately only six parts to the thousand in the saliva are composed of anything but water, it would seem an easy matter to differentiate, diagnose, "prognose," and treat, with the object of protecting the teeth from the ravages of decay, erosion, and so-called catarrhal interstitial gingivitis. But such is not the case.

Among the present-day writers, we have been taught by Miller that the ravages of decay are due to the presence and activities of micro-organisms, in greater or lesser populative colonies. From Black we have learned that they are held to their work of disintegration by being in some manner glued upon the tooth-surfaces in gelatinous plaques. D. D. Smith has demonstrated beyond peradventure that these plaques can at least in considerable measure be prevented from harboring this mischief by frequently disturbing them, and that the catarrhal conditions supervening at, and just under, the cervical gum are amenable to treatment. Talbot shows, with numerous lantern slides, that when we have arrived at the age at which, in after-dinner parlance, our Osler would condemn us to the scrap-heap, Dame Nature begins to undo her joiner-work—letting down the bars, as Kirk promulgates, by that most subtle and insidious process of faulty metabolism.

But above all, and more than to all, so far as we have knowledge regarding the saliva, the world is indebted to Dr. Joseph P. Michaels of Paris, France. But his inquiries have—most wisely, no doubt—been framed more particularly to embrace general systemic rather than local pathological conditions. In the meantime, teeth have died and "worms have eaten them."

The paramount question for us as dentists to settle is, What shall we do about it? If we could turn that six parts to the thousand of *something* into *all* water, now!

Your committee during the current year has labored somewhat, but has accomplished little. From fifty-seven we have increased the number to exceed one hundred observations. We still find, just as we did last year, that in proportion as the sulfocyanate provings are excessive in saliva the teeth are comparatively immune from dental caries, while, on the contrary, in those persons in whose saliva we have discovered *no* sulfocyanate, we have as invariably found soft, ill-calcified, and carious teeth. For the sake of exact fairness it should, however, be stated that examinations have not been made of the saliva of persons suffering from advanced diabetic, Bright's, or other extremely faulty metabolic health states.

It would hardly seem possible that after so many provings the ratios above quoted could still remain merely a matter of coincidence. We have attempted to find out whether the presence or absence of the sulfocyanates in saliva made any difference in the solubility of gelatin.

Experiment No. 1.—(A). 2 cc. water, 2 cc. saliva, ½ gr. gelatin (saliva from mouth of writer, showing marked sulfocyanate provings), kept in corked test tube at room temperature. Showed that gelatin was in complete solution at the expiration of 96 hours.

(B). 2 cc. water, 2 cc. saliva, ½ gr. gelatin (saliva from mouth of Mrs. B., showing no sulfocyanate), kept same as experiment No. 1 (A). Showed that gelatin was scarcely half in solution at the expiration of the same length of time.

If Black be right these findings have some bearing, since in the sulfocyanated saliva gelatinous plaques will be less likely to be abundant, and even when present they will be softer and not adhere to tooth-surfaces so tenaciously; and as a consequence the tooth-brush and the use of other prophylactic measures may the more readily dislodge them.

Inasmuch as this seems feasible, at this juncture we put the question, Would it not be more than wise to have some further evidence? At purely a nominal expense—say not more than half a dollar—an intelligent practitioner can test the saliva for sulfocyanate for an indefinite number of his patients. It is not requisite for the accuracy of his evidence that he should be a chemist, the procedure is quite too simple. We would throw it out as a suggestion that next year's correspondent be delegated to gather in evidence much on the same plan that Dr. Buckley's treatment has been canvassed by this year's correspondent. Thus:

SALIVA SULFOCYANATE TEST.

[For 1907 Report.]

To the Correspondent of the Dental Society of the State of New York:

Dear Sir,—I am pleased to contribute the following report of an examination of the teeth and saliva of one of my patients:

Date of examination: ....

Name or initials and sex of patient: ......

Nationality and approximate age: ....

Condition of teeth: [Excellent. Wretchedly decayed. (Only extreme cases wanted.)]

Color of imperfect dentin: [Black. Brown. Straw-colored. Chalky white. (Cross out all but corresponding color.)]

If previously filled, do teeth retain fillings well?

The *differentiating characteristics of saliva* in the patient's mouth are—

(a) Quantity, when secretions are *not* provoked: [Much. Moderate. Little.]

(b) Consistency: [Thin and watery. Thick and ropy.]

(c) Color, as seen in test tube: [Colorless and transparent. Bluish. Yellowish tinge.]

(d) Precipitation: [None. Has sediment. Has cloudy floating masses.]

(e) Odor: [Odorless. Sickly sweet. Of urine. Of feces.]

When to one cc. of saliva is added one cc. of distilled water and shaken together in a test tube, then five drops of iron perchlorid ($Fe_2 Cl_6$) are added, and again shaken, the resulting color of the liquid resembles most closely the color below marked No.........

1	2	3	4	5	6
☐	☐	☐	☐	☐	☐

Dr. ....
No. ....Street
City ....
State ....

Note.—To make the above test one requires a small graduate, one or more small test tubes, and the perchlorid of iron, which would entail an expense of but from 25 to 50 cents.

Remarks:

Additional blanks furnished on application to ....

If our surmise that the presence of ammonium sulfocyanate in saliva spells "good teeth" should prove correct, it may be possible to induce by stomach medication this happy state. According to Squibb, potassium sulfocyanate may be administered in from one to three-grain doses without danger. It is prescribed as a nerve sedative, and Professor Hill assures us that it is quite among the possibilities to employ much smaller dosage and still have it show eventually in analysis of the saliva.

Just picture in your mind's eye the status of our profession, with the dental bur and engine abandoned, when we have thus all joined the ranks of the regular "pill doctors." Tangent to this line of thought and investigation, we wish to present one other: Though our provings proved only negative, we report our effort at mystery-solving solely in order that others may avoid a useless expenditure of energy.

Your committee was impressed with the erroneous idea that the mixed saliva, as it entered the oral chamber from its several different sources, in combining might perform a double decomposition, the result of which might be that subtle and deadly poison, hydrocyanic acid. Though dilute and impure, we thought this still might appear in quantities sufficient to work some restraint on the activities of micro-organisms without destroying them. The report of one of Buffalo's most competent authorities in the realms of organic chemistry is hereunto subjoined. For this experiment, Dr. Muntz, Dr. Ballachey, and the writer each furnished samples of their own saliva. Each had previously proved to be sulfocyanate pregnant.

The samples were investigated by two separate tests. The limit of one (Autenrieth) is 1 part in 4,000,000; the limit of the other is 1 part in 312,000. By neither of these tests was Professor Hill enabled to detect the slightest evidence of free hydrocyanic acid.

Discussing last year's report of this committee, Dr. Buckley of Chicago, said: "I was unable to understand the translation of Dr. Michaels' article. His conclusions seem to indicate that in mouths that are *prone* to caries there is an evidence of sulfocyanates."

Dr. Michaels only made this claim, as we understand his writing, in the rare cases of extremely faulty metabolism—diabetic mostly, sometimes Bright's. In these cases he found the saliva extremely hyperacid, out of all proportion to be balanced by the ammonium in combination. As we observe them in daily practice, of the more frequently met conditions Michaels* says: "If we study the chemical composition of the saliva of hypoacid individuals, we shall find that it contains glycogen, albumin, perhaps inosite, mucin, basic chlorid, with ammonia in greater quantities than normal, sulfocyanate and biliary acids in less proportion than normal, and is an ideal medium for the development of microbic contagion." To us it is incomprehensible that after careful study Dr. Buckley could misunderstand so direct and plain a statement.

When we made our studies to report a year ago, we had never seen, had hardly heard of Dr. Michaels' writing on this subject, but, as shown by journal or last year's case-book, our tabulations coincided to these conclusions to a nicety in every such case examined.

If accompanied by saliva with sulfocyanate provings, Dr. Michaels says some hopeful things about teeth affected with extremely dark decay. Among the cases your committee has been tabulating are two in which the decay of the teeth was extensive and almost black. Both cases came under observation in the practice of the writer. The first, that of Miss F. G. L., age twenty-one, is accompanied by the following notes:

Case I. April 2, 1905: Saliva slightly alkaline.

Sulfocyanates present, intensity of stain marked 2½.

Ammonium present, intensity of stain marked 2.

Appearances: Very heavily loaded with flocculent masses, has decidedly yellow tinge, and is extremely ropy.

The history of the decay in the teeth is that it has been of very slow formation, occurring most frequently in sulci; but wherever located it is inky black. Teeth have retained fillings without re-decay for the past three years, few new cavities having appeared. Under "Smith" treatment, tissues about the teeth which previously were much hypertrophied have improved in a marked degree. The teeth have constricted necks and short clubby crowns; arch highly Gothic. The upper incisors overbite the lower greatly. The upper lip is short, and mouth-breathing is suspected, but denied.

Case II. Ed. Youngman and a peculiar young man. When a little boy and as a youth he was the writer's patient. The teeth, even the deciduous, were miserable; the patient was nervous and excitable almost or quite to the point of hysteria, and upon the slightest touch of the instrument to sensitive dentin he would wriggle and twist, and then would faint away, or more correctly speaking, would pretend that he was going to. Finally, becoming weary, we temporized and really tried to do nothing. He ceased coming eventually, and I congratulated myself, as you all have sometimes when you lose a patient.

This year he appeared again, with large, yellow, well-developed teeth, in excellent occlusion, but full of monstrous cavities, each one as black as an ink-well; several pulps were exposed, and the dentin was still highly sensitive.

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*"Sialo-Semeiology."

> Of the interim, his mother tells the following interesting story: At the age of sixteen, restless and fidgety, unable to fix the attention or pursue any kind of study, under reproof he ran away from home, and tramped for the greater portion of a year. Now and then, from his own endeavors he was provided with a little money, but most of the time he was a typical tramp and beggar.
>
> Of course such a boy would, like Romeo, fall in love. On the instant of arriving at puberty, the little scamp clandestinely married. Coincident with marriage came a breaking out; he has suffered a distressing eczema. His doctor assures him—so he avers—that it is entirely due to hyperacidity of the blood, and he is almost well now under treatment.
>
> Whether on account of marriage, or on account of the treatment, he certainly is a transformed entity. While suffering much, he is as brave as a Trojan, and is going to have his teeth treated.
>
> His brace-up seems to be moral quite as markedly as physical; he is making a home for himself and wife, tending a monstrous lathe, in the face of some real danger, earning good wages and saving carefully, and according to his mother he is really transformed—as steady as a Presbyterian deacon.

Naturally his parents are afraid it is too good to last, but, gentlemen, we think differently. Potassium sulfocyanate—the limit, three-grain doses—we believe ought here to have been administered. The hysteria almost to mania, according to Squibb, would disappear, while simultaneously, it is our belief, sulfocyanate would have appeared in the saliva, and the teeth would have been much benefited. As it was, before reading Michaels, we were tempted to condemn them (his teeth) to the forceps. We should have done so had it not been for our experience in the case of black decay just reported.

Will Dr. Kirk, when he criticizes, kindly tell us, Was this faulty metabolism, this hyperacidity, due primarily to the nervous state, or was the hysteria due to faulty metabolism? Did arriving at puberty cure both, or was it brought about by this young man's marriage? To be sure these bad teeth are not yet saved: but we have the faith to fill them. Why? because the young man is beginning to show moderate sulfocyanate provings in his saliva, and because compared to former conditions it is not one-half so ropy.

CONCERNING THE INVESTIGATION OF AMALGAMS.

The labors of your committee were materially facilitated by the accession of a fine Weiss binocular since the reading of our last report. We know through whom it came, but your committee was too overjoyed upon receiving it, and just a bit too apprehensive lest it take to itself wings if we proved too inquisitive. We recommend that the president appoint a committee to interrogate himself as to whether it is rented, begged, bought, borrowed or stolen from the manufacturer. This committee had not the nerve to spend so much money to buy one for itself. To the question, Is it fine to have a nervy president, we vote "aye."

Your micrometer as made was a delusion most unreliable; we have managed to have it tinkered at slight expense, so that its readings are fairly accurate.

Tomorrow, at the clinic, we shall ask to have a table assigned to us where those of you who are interested can examine both our last year's tubes and some new ones we have made but recently.

Following the recommendations of last year's committee, we have invited several dental manufacturers to give us assurances that they would market a certified product, giving micrometer readings, etc., to accompany each ounce of alloy. Our most courteously worded invitation has been as courteously declined, the actuating sentiment seeming to be that inasmuch as they are doing the best th the skill of man could devise, we ought to be satisfied with the dance as it is, and not indulge in "shooting at the fiddler." Perhaps they are right; it is quite likely that they are taking greater pains as to the manufacture than are we as to the proper manipulation.

There has, however, been one partial exception to this general refusal. A letter has been received from the Dental Protective Supply Co. offering to adopt our plan, and place upon the market a certified alloy; provided, however, that they do not have to divulge the ingredients nor the proportions of the ingredients of their product. They claim that to make public their formulas would be to invite imitation, to the detriment of their own business. They are willing and anxious to take immediate steps toward the commencement of the work, provided the society is willing to have it done in that way.

We would like an expression of opinion from this body as to the advisability of encouraging them to undertake this modified venture.

Respectfully submitted,
Frank W. Low, *Chairman.*

Reports of Dr. Herbert M. Hill, *City Chemist and Professor of Chemistry, University of Buffalo.*

Buffalo, N. Y., April 9, 1906.

On March 29th three samples of saliva were delivered to me by Drs. Low, Ballachey, and Muntz, for the purpose of detecting any cyanids or free hydrocyanic acid that might be present. The presence of sulfocyanates had been detected in all salivas from the same persons by previous test by Dr. Low. The samples were marked, in the order of the names above, A, B, and C.

In order to detect hydrocyanic acid in the presence of the other cyanogen compounds known to be present, advantage was taken of the method advised by Witthaus (*Medical Jurisprudence,* vol. iv, page 620) and Jacquemin (*Ann. de Chim. et de Phys.*, 1876, 5. s., iv, 135).

The distillation was conducted in an apparatus similar to one that had been used some years previously in an extended investigation of hydrocyanic compounds with perfect success. The distillation of the salivas was continued one hour in each case, the distillate being collected in a flask so arranged that the condenser tube was under water at all times, so that no vapor could escape condensation. The amount of saliva in each case was approximately 20 cc., and the distillate from each sample was 100 cc.

Tests on each distillate were made as follows:

(I) 40 cc. of the distillate were taken and rendered alkaline with dilute caustic potash solution; then a few drops of a solution of ferrous sulfate were added and one drop of a solution of ferric chlorid, the mixture well shaken, and warmed gently. Then hydrochloric acid was added, to acid reaction, and the container was set aside for two days. At the end of that time the solution was examined for the presence of Prussian blue. This test will detect 1 part of hydrocyanic acid in 5,000,000 (Link u. Moeckel, *Zeitsch'ft für Anal. Chem.*, 1878, 17, 455).

(II) About 30 cc. of the distillate were taken and four drops of potassium hydroxid solution added, and then five drops of yellow ammonium sulfid solution. The mixture was evaporated to dryness on a water-bath, the residue dissolved in a small amount of distilled water, and acidified with dilute hydrochloric acid. The mixture was then filtered through a double filter, and to the filtrate was added a drop of ferric chlorid solution. In a material containing hydrocyanic acid a reddish color would result. The limit of this test is 1 part in 4,000,000 (Autenrieth, page 18).

(III) A second portion of the distillate—about 20 cc.—was taken, and to it was added a few drops of a solution of sodium nitrite, then a few drops of a solution of ferric chlorid, and enough dilute sulfuric acid to give a bright yellow color. The solution was then heated to boiling and ammonium hydroxid added to precipitate the excess of iron. The mixture was then filtered, and to the filtrate was added two drops of a very dilute solution of ammonium sulfid. In the presence of hydrocyanic acid a violet color should appear, and pass through blue, green, and yellow. The limit of this test is 1 part in 312,000 (Autenrieth, page 18).

The distillate from A subjected to the three tests detailed above gave no evidence of hydrocyanic acid in any test.

The distillate from B subjected to the three tests detailed above gave no evidence of hydrocyanic acid in any test.

The distillate from C subjected to the three tests detailed above gave no evidence of hydrocyanic acid in any test.

Herbert M. Hill.

[See page 1039.]

Buffalo, N. Y., May 8, 1906.

Dr. F. W. Low:

Dear Doctor,—The sample of saliva treated as you suggested gives results as follows:

No. 1.

Saliva,	2 cc.
Distilled water,	2 cc.
Gelatin,	0.0300 gm.

Time of solution at 91.4° F.: 1 hour and 50 min.

No. 2.

Saliva.	2 cc.
Distilled water,	2 cc.
Potassium sulfocyanate,	0.0033 gm.
Gelatin,	0.0300 gm.

Time of solution at 91.4° F.: 1 hour and 33 min.

Respectfully,

Herbert M. Hill.

Discussion.

Dr. E. C. Kirk, Philadelphia, Pa. I presume that it is proper for me to say that I am intensely interested in the saliva end of this report, and being intensely interested in that subject I want to express my thanks not only to the committee that has made this report, but also to the society for having in this practical way instituted a line of research which, to borrow a phrase from the essayist's report, I believe will be productive of good results.

I do not agree with several things stated in the report. In saying that, I wish to forestall any misapprehension; I criticize him merely for the reason of getting at what I conceive to be the truth. There are many things about the saliva that I do not understand, and in these I want help; I have devoted now some years to a careful study of this question, and I am convinced that in the study of the composition of the saliva we are approaching the solution of the etiology of dental caries, or rather the question of immunity or susceptibility to dental caries, in a more direct line than we have heretofore. I consider, as you all consider, that the question of the etiology of dental caries in a broad sense has been solved. We know very nearly what it is that causes dental caries, but we do not know, or have not yet received an answer to the question of why it is that so many people do not have dental caries. It seems to me that the answer to that question is to be found along the line of research which has been reported here today.

I am interested particularly in the studies which the chairman of the committee has made with reference to the significance of the sulfocyanid of potassium in the saliva. A great deal of work has been done on that question, not only by those interested in the oral side of the problem but by physiological chemists, who view the subject from a purely scientific standpoint, in the desire to explain what this peculiar compound means. A great many observations have been made upon the nutrition of individuals who had manifested a high percentage of sulfocyanid of potassium in the salivary fluids: They have endeavored to solve the question as to whether it was produced by the salivary glands, or whether it was something found in the blood stream that produced it. That has not been definitely settled, and so the question is an open one. A great deal of study has been made as to the existence of sulfocyanid of potassium in the liver, and the work done in that direction, notably by Fenwick,* is significant. The findings which Dr. Low has made with reference to the relationship which the high condition of sulfocyanid in the saliva bears to the absence of caries I deem important, and I corroborate his findings in that particular; that is to say, in mouths that I have examined—and I have examined many hundreds—it seems that in nearly all instances where the sulfocyanid in the saliva runs high we have less caries, or an arrest or absence of caries. Thus far I am willing to go as corroborating his observations, and also as corroborating the observations of Michaels along the same line. We very rarely find sulfocyanid in mouths where caries is present in any quantity. As a matter of fact, I believe it is generally true that the existence of sulfocyanid is coincident with the diminution, arrest, or absence of the carious process. But the essayist goes a little farther than that, and this is where I would be inclined to place an interrogation point after his statement. *Because* we have sulfocyanid in mouths in which caries is less than in other cases, it is not at all clear to my mind that it is the presence of sulfocyanid that has an inhibitory action on the carious process. I think it is a coincidence. We cannot ignore the fact that the mode by which caries is produced is now known from the study of the subject by Miller, Black, and others, and we

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**Lancet*, 1877, vol. ii, p. 303.

know almost precisely how that process is brought about. We know that it is due to the action of certain bacteria that are, in general terms, only capable of multiplying and producing acid end-products in a medium which contains fermentable food—carbohydrate food. Now, Dr. Low is inclined to take the view that the presence of sulfocyanid acts in some way as an inhibiting substance upon the growth and activity of these organisms. But I think if we look a little farther, and bear in mind that caries is dependent upon a fermentative process, and examine the composition of these salivas, we will notice that in all of them where sulfocyanid runs high, the fermentable carbohydrate element—this other substance which Michaels has referred to as glycogen—is always low, or almost wanting.

In his report of last year Dr. Low gives what he calls a typical chemical saliva test; and in this instance he finds a quantity of sulfocyanid that he marks as "1." I do not clearly understand his explanation of the percentage.

Dr. Low. This was marked "1" simply to show the comparison between that and the one marked "4."

Dr. Kirk. Then they are simply relative terms to each other, and do not represent percentage. That is to say, the case in which the glycogen was high, with the absence of sulfocyanid, is represented as "1," and the other case where the glycogen is absent, with the sulfocyanid present in abundance, is represented by "4." It is true that glycogen, or what passes for glycogen by the iodin test, is especially abundant in those susceptible cases where caries is rampant, also that as the glycogen increases we find an increased susceptibility to caries and a diminution of the sulfocyanids. Whereas, on the other hand, when the conditions are reversed, immunity or relative immunity, or arrest of caries, is accompanied by a high grade of sulfocyanid and low percentage of glycogen. Consequently the point I make is that while I think Dr. Low has been very close to the solution of the problem which led him to undertake his saliva analyses, he has gone astray, from the fact that it is not the inhibitory action of the sulfocyanid, but rather the presence of an excessive amount of glycogen or fermentable carbohydrates found in susceptible mouths, and that the absence of that food for these bacteria is coincident with the high sulfocyanid element in mouths that are relatively immune.

I do not want to take up too much time in discussing this matter. We could talk for several meetings with profit, as there remains much yet to be done.

I have spoken of the variability in the appearance of sulfocyanids and the fermentable compounds in saliva, and I desire to call attention to a source of error which any observer may readily make. We see mouths where we find caries of the dark or black type in the teeth that we call "hard" teeth, in which the process is slow, and we say that in this case caries is not proceeding rapidly, but we should read back and find out whether this type of carious process fairly represents the case or not; whether early in the life of this patient caries did proceed rapidly with the usual physical appearances presented by rapid caries. We know that the nutritional activities of the infant, child, youth, and young man are different from those characteristic of the period which we call consolidation, a period when the nutritional balance is more nearly reached. We have been spending years in growing, and we have been forming an eating habit, which habit is carried over into the period of consolidation; and then we are eating more than we can oxidize, and the result is that our nutritional method is at fault—with respect to our age and physiological needs—in that we are eating more than we have any right to, and are producing waste products that are irritating in character. We begin to have erosion; a certain kind of pyorrhea alveolaris; we have inflammations of the ligamentous structure which retains the teeth in their sockets, and many other things happen to us. We may become neurotic, due, in many cases as I believe, to an over-production or defective elimination of the waste products, the result of our retaining the food habits of youth. Now, if the composition of the saliva varies—and I think Michaels has demonstrated the fact beyond a doubt that the composition of the saliva varies with different periods of life—then a certain composition would be the representative of one type of nutrition in youth, and we would have a different composition in middle life or later. That is, we may have a hypoacid condition in youth—that period in which we are most susceptible to infection—and later in life outgrow it as our food habit changes. I have been interested in studying the saliva of these individuals of the hypoacid type; those who were not only susceptible to tubercular infection but who already had it, and I have studied the saliva of individuals going through the nutritional treatment and who were becoming cured, showing the response to that treatment; and I have seen the saliva pass over from the hypoacid state to the hyperacid state, running into that nutritional stage in which the individual became gouty because of the artificial feeding, the outdoor exercise, and the overfeeding, which is the most successful treatment for tubercular infection.

Now, I want to try and answer, as far as possible, the moral question propounded by Dr. Low about the young man who was erratic in his youth, and afterward became so reformed that he was up to the standard, as he terms it, of the Presbyterian deacon. The question is asked whether this faulty metabolism, this hypoacidity, was due primarily to the nervous state, or whether the hysteria was due to faulty metabolism; that is to say, which came first?

My own belief is that from a study of the circumstances of quite a number of similar instances, I should regard the man's moral decadence as the result of two things: In the first place heredity; that is to say, the type of tissue that the man inherited in the beginning. Having inherited this certain type, his nutrition manifests its activities in a certain definite way—faulty in character by reason of the faulty tissue in which it was expressed. I should then regard the growth of this nervous state to be an expression of his faulty nutrition; that is to say, the character and accumulation of his waste products were such that he reacted nervously to the stimulation which they presented.

The theory was advanced some time ago that the hyperacid individual, the individual who is gouty in character—one who has a tendency to articular troubles, erosion, etc.—that such individuals are more or less immune to tubercular infection. For about a year I made a study of the saliva and urine of such people, confining myself to that line of research exclusively, and I found that the characteristic feature in the urine of a great many of these individuals was represented by a peculiar formation of disk-like or circular deposits, which were found to be sodium oxalate. Also, that the crystals of sodium acid phosphate appeared to be perforated with round holes. I came to study the nature of the compound which produced this peculiar perforation in the phosphate crystals, and finally determined that this peculiar compound was ammonium cyanid. It was a waste product which should have been used up in the liver, but as the liver was so overworked, it was unable to take care of this waste product, and in consequence it passed on into the blood plasma, and was eliminated by the kidneys and in the saliva. I found that everyone thus affected was either over-stimulated or else the stimulation had reached such a degree that there was a tendency to nervous exhaustion. Then I began to make a study of the effect of ammonium cyanid, not only to study the physical effect, but to see whether the existence of this ammonium cyanid in the blood stream could be one of the things that would raise the standard of resistance to infection by tuberculosis. We know that no animal is more readily infected with tuberculosis than the rabbit; and so I conducted in connection with Dr. Bergey, bacteriologist at the University of Pennsylvania, a series of experiments upon the physical action of ammonium cyanid, and found that it did not increase the resistance to tubercular infection in the rabbit; but what we did find is peculiar, viz, that it acted as a nervous stimulant, the rabbits becoming almost hysterical; that there was increased hyperemia of the cutaneous surface to such an extent that on being roughly handled the rabbit would squeal, thus indicating intense pain, such as that of the patient who could not stand the touch of the instrument.

This illustrates the degree of nervous irritability which accompanies this type of cases that are loaded down with sulfocyanid. There was not only hysteria, but a hyperemia of the surfaces—an engorgement of the capillary cutaneous vessels. Therefore, with that as a background, together with a general study of the cases, my answer to the question of Dr. Low would be that I should regard the improved morale of this patient as due to a change of his nutrition. Whether it was his marriage, better behavior, better food, or better hygienic surroundings, I do not know, but certainly I regard it as nutritional; I consider the improvement as due to the betterment of the nutritional conditions.

I would like to draw Dr. Black out on this question, and I want to be corrected if I am wrong. The essayist has spoken of the gelatinous plaque, and the relation of the carious process to that: I have never had any conversation with Dr. Black on this point, but from the reading of his reports, I gather the idea that he does not hold the opinion that the gelatinous plaque is responsible for caries, but merely that its existence tends to localize the formation of these bacteria that are directly responsible for the caries activity. That is to say, the formation of the gelatin in the plaque-like deposits is not due to the caries-producing organism, but it is coincident; that it merely aids in the localization of the process in a mechanical way, so to speak, just as a break in the sulcus of a tooth may tend to locate the caries-producing bacteria at that point.

The essayist also referred to the effect of sulfocyanid in the saliva upon the power of the saliva to render this plaque soluble. In looking over this report, it seems to me that it would have been of greater scientific value if he had also studied the function of these bacteria which are there in the saliva in the mixed culture.

Dr. G. V. BLACK, Chicago, Ill. I only want to accentuate my interest in this subject, and if I may say a word that will add to the general interest, I shall be glad. Dental caries as it relates to the dentin has been well made out by Dr. Miller—made out in such a way that it will stand in the time to come; that is to say, I think he arrived at the truth. But the beginnings of caries of the enamel have scarcely been studied at all. Those powers, those forces, that localize it have scarcely been studied at all. We are only beginning to study them, and I feel that we are beginning very feebly. We do not yet know what they are. If we can learn the true nature of these phenomena in such a way as to have some power or control over them, we will have done much to limit the ravages of caries. If we can prevent the onset of caries, we will have accomplished something. Caries of the dentin is merely coincident in the destructive process; but what we wish to know today is the power that localizes caries in the enamel. and causes it to assume a tendency to spread on the enamel and over the margins of well-made fillings. You know we are scarcely beginning to study the physical characters of caries of the enamel, and let me assure you it is something entirely different from caries of the dentin, though I fully believe it is brought about by the same micro-organisms, and in a degree by the same force or forces. But there is something more, and that something is the thing that has interested me for many years.

Dr. Kirk wished to draw me out in regard to the gelatinous plaques. Before I say another word on the subject, I want it understood that I mean a gelatinous substance. I do not mean accumulations of micro-organisms loosely held together on the surface of the tooth, inspissated mucus on the teeth, greasy accumulations on teeth, or any of these things; I mean a substance that is gelatinoid or gelatin-like, but not gelatin. Not soluble or meltable as gelatin, but which has the appearance of the latter. Now, I have not said, heretofore, all that I would like to say, because I do not know enough about it. My studies lead me to believe that upon the surfaces of the teeth—and particularly on those surfaces that are fully exposed to washings by the salivary fluids, as buccal and labial surfaces—there is always a percentage of this compound first deposited, which has to do with the onset of caries of the enamel; and that this deposit acts in preventing the acids formed by the micro-organisms from being dissipated in the saliva, and that action is the important rôle of the gelatinoid material. This material is formed by the same micro-organisms which produce the acids that cause caries. I further believe from my observations—and now I am speaking of beliefs, not what I know—that the opportunity for the formation of this material by the micro-organisms depends upon some peculiar condition of the saliva at the time. Ordinarily this gelatinoid material will be passed without being seen. Now, I do not know that I need to go any farther in the discussion of that phase of the problem. Until others have seen and verified what I have seen; until others have made observations similar to my own in the mouth, this, of course, must rest as unproved, because it requires a consensus of opinion to establish any proposition of this kind, no matter how certain of it I may feel myself. This is my feeling about it, but I shall not give up this phase of the problem until it is settled.

I am very sorry indeed that I have not the time or the strength to enter more energetically into the studies of the saliva which have to do with this phase of the subject of caries. I am, however, accumulating a very large number of slides illustrating the beginning—the very first beginning—of caries in the enamel, and I must say that after all these years of study of caries, this series of slides is bringing me new surprises continually.

Now a word as to the amalgam question. Of course you all know that I am especially interested in this subject. I have been consulted by manufacturers recently as to what should be done, but I have ideas different from the propositions recently made as to the method of arriving at the best results, which cause me to feel very much like offering this at the door of the dental profession, rather than at the door of the manufacturers; and I feel like saying to you now that whenever the *dental profession will demand* an alloy of a certain grade that is reasonable—and there is no reason why we should be unreasonable—the manufacturers will furnish it, and furnish it gladly. The difficulty is that so many in the profession seem not to care, or seem not to suppose that they can be benefited—there is the difficulty; but whenever it is undertaken, and undertaken judiciously and carefully, I feel sure that you will have the support and the willing support of the manufacturers. There are several ways in which this can be brought about and nobody be the worse for it. During the past ten years, and a little over, I have kept up my work with this material, and during that time I can say that I know of many fillings that have been made by myself and others that have kept as clean margins, just as free from any discoloration of the dentin or enamel, as have any gold fillings, and believe this may be made general. I do not claim that this can be done with the same regularity as can be done with gold; I do not claim that it is as easy to do this in any ordinary method of working with amalgam—the manipulation of amalgam to produce regularly first-class results is more difficult than the manipulation of gold, therefore it is in that degree a less reliable material—but that the operations with amalgam which you do for your patients can be improved, and vastly improved, I feel confident without any possibility of doubt. But before this can be done we have a work ourselves, as well as the manufacturers. There are manufacturers today who can produce just what we want, and know just how to make it; know just how to balance the metal in their alloys so that there will be no contraction or expansion. We cannot manipulate such an alloy so that it will contract or expand, because it depends upon the mutual action of the metals of the alloy that are beyond our control in any manipulation we may give them.

Now let me say that there are several points of danger in the use of amalgam that have been overlooked. My assistant came to me a few days ago and said, "Doctor, here is an amalgam filling, one of a series of tests, to which something has happened; somebody has handled it and got mercury on it." I said, "No, there is something wrong with that alloy." That filling containing seven grains of amalgam shed from itself during the process of setting for five days continuously, an average of about 400 mgm. of mercury. I had seen that condition in alloys, in my experimental work, but this was the first time I had seen it in an alloy offered on the market. Now what does that sweating out of mercury mean for the patient who has teeth filled with such stuff?

I regard these matters as very serious in the present methods of practice of the dental profession, and if my words will stimulate you to greater effort in this matter, I shall be satisfied.

Dr. Low (closing the discussion). Dr. Kirk referred to a certain matter that has not been spoken of in my paper at all, and that is the tests given in the footnote of the paper. It seems to me that those tests do prove a little something. Now, both of those samples of saliva were from my own mouth. One was just as thoroughly impregnated with bacteria as the other, because it was spit at the same time; it was put in the incubator at the same time and taken out at the same time—the only difference being the addition of the potassium sulfocyanate, 33/10000 gm. by Dr. Hill before the tests were made. The tests show, I think, that the solution of the plaques, if they are gelatin, would take place more readily in the sample to which the potassium sulfocyanate was added. In one case the gelatin was entirely dissolved in one hour and fifty minutes; in the other case, where the potassium sulfocyanate was added, it was dissolved in one hour and thirty-three minutes, which is approximately ten per cent. more rapidly.

Dr. Kirk misunderstood me if he thought I imagined that the sulfocyanates would destroy the bacteria; because in my paper last year I reported that I thought it would rather help their rapid proliferation. The only thing I hoped for from this mixture of saliva and sulfocyanate was that it would result in the same saliva that is represented by the hypoacid mouths—and it is in such that we find the teeth decaying most rapidly—that if we could treat this saliva so that we could keep this gelatin in solution, the bacteria could not get any chance to attach themselves to and proliferate on the teeth. I want this society to have all over the country representative dentists, who will test the saliva for this condition to ascertain whether any difference really exists.

One other thing: I would like to ask Dr. Kirk why it is that physicians give potassium sulfocyanate for hysteria and mania (*Squibb's Materia Medica,* 1906, page 101), if it be true that the sulfocyanates emphasize the highly nervous state that you mention? I would also like Dr. Black to say whether he thinks it is possible, in naturally hypoacid saliva, for us to hold the gelatinous plaques in solution by the more abundant presence of the sulfocyanates, if it should appear that by stomach medication such conditions could be induced?

Dr. Kirk. I confess my ignorance on that point. I did not know that they gave sulfocyanates for hysterical mania. And as to the reason why a doctor would do so, I can only answer that not being omniscient I cannot tell why he does that and many other things.

Dr. Black. I hardly know how to answer the question in the way it is put, as to whether or not the sulfocyanids would hold these gelatinous plaques in solution. My own opinion is that the condition is not present in saliva until it is thrown out by the activity of the micro-organisms under certain conditions; that it is the product of the growth of the micro-organisms pure and simple, and that the condition or chemical constitution of the saliva gives the opportunity for this in the one instance, but does not give the opportunity in another.

The next order of business was the reading of a paper by Dr. G. V. BLACK, entitled "Consideration of Evidence in Scientific Investigation."

[This paper is printed in full at page 1015 of the present issue of the COSMOS.]

Discussion.

Dr. S. G. PERRY, New York. I have been profoundly impressed with this almost romantic story which has been told us today—the story of the advance of the scientific methods. I want to refer to what I would venture to call Dr. Black's scientific imagination as an anomalous term, because science has nothing to do with the imagination; and yet if a scientific story was ever told with imagination we have listened to one this afternoon. The tones of his voice, the emphasis with which certain sentences were uttered, and the significance which he gave to certain points in this wonderful story show that he has what might be called a scientific imagination—the ability to realize what these principles mean to the human race, and a practical application of them so that every living being upon the earth today may be thereby benefited. I can imagine no more interesting story than that told today, marking the gradual steps by which we have learned the things we know. Let me ask you to stop for a moment and realize the importance of the things he has so well told us. Why, there is a volume in that paper! Perhaps the young men here will not realize so fully as we older men what that story means. I could not but be impressed with the advantage possessed by the young men in having the opportunity of listening to such a paper, so reasonable, practical, right, and always conservative.

Dr. F. W. LOW, Buffalo. I believe I am entitled to say a word on this paper. Dr. Black has spoken most impressively upon the subject of amalgam. Now I have no doubt that if I were a dental manufacturer I should talk as manufacturers do when invited to make any change in the marketing of their products. If I had been in commerce I should have made the same reply that they have made, and I think they are justified in seeing it that way. But, as Dr. Black says, when we make the demand, whether we work our share of the reform or not, we will get what we want. I believe on this schedule board there are only four alloys that I would use, and I have my choice even between these four. I would eliminate every one of the other alloys, for the reason that they do not possess the essential qualities of a good amalgam in anywhere near the same degree as these four do. Here [illustrating] are some of the older alloys that are designated as having margins wide open. The manufacturers say that as long as there is a demand for them, they will continue to sell them. From a commercial standpoint can you blame them? It would be against their policy to make a micrometer reading of one of their own better alloys and compare it with the others, for fear that some customer, who had been using these for years, might give them up, and instead of using the better grade made by the same manufacturer, would choose one of the other manufactures. But as Dr. Black says, if we insist upon knowing the test for edge strength, for stability in shape, and micrometer tests for shrinkage, they will comply with our demands. When we have one single manufacturer to adopt that plan, the others will have to get into line.

Now, I believe if we make some effort we can have all alloys made as good as these four, for the other fellows will not dare to market the bad ones any longer. I know at least one company who are making one of these four good alloys, who are making bad ones also, and I want to drive out of the market all of the latter; and more than all others, I want to drive out of the market impostors such as Dr. Scott, who went about the country trading on the sympathies of the dental profession by claiming to be a disabled practitioner, a war veteran, and a brother-in-law of Dr. Black, whom he claimed as his instructor for the method whereby he made his dental alloy. The products he sold were absolutely unfit for any dental use, but he seemed to have fooled even the deans of our dental colleges.

Dr. E. C. KIRK, Philadelphia. I would like to say a great deal, but I will only say a few things with regard to this presentation that has been made by Dr. Black today. This is a subject that is very near to my heart, but I believe it is of vital importance to all of us. As I interpret his paper, it is a plea for the scientific method in the solution of the problems that we are expected to solve—that we must solve. He has given us a pretty illustration of the way in which the scientific method works out in the solution of the various problems with which science has to contend. He shows some of the dangers that qualify the accuracy of our scientific method, and has brought out into bold relief—although not so specifically—that difference of mental attitude between the so-called scientific and the so-called practical. How often do we hear it said, "Oh, well, that is theory. What I want is something practical." Immediately, when a man talks that way, in my judgment he publishes the fact that he does not know the meaning of the words he is using.

I want to say one or two things about this scientific method, about its objects, and about the difficulties with which we have to contend in the solution of a problem. We are after the truth. That is our object, the truth about certain things. We want to know absolutely what is the truth about these things. They are solved when we know the truth about them. The amalgam question—we want to know the truth about that; we want to know the truth about fermentation; we want to know the truth about the etiology of dental caries. Now, how are we to get at it? When the criticism is made that a thing is theoretical, I would say how else are we to do it. What is science but truth, organized truth? What is science but a truthful, precise, accurate method of getting at a question? It is the truth we want, I do not care whether it is in theology or whether it is in dentistry, and one very peculiar thing about truth is that it is like an electric light suddenly flashed in the darkness. When we are searching for this or that fact about a certain thing, and the truth is suddenly developed, it hits us like an electric lantern—very much like the light of the burglar's lantern, which is made for the purpose of blinding you. We have been groping and hunting for the light upon this or that problem that concerns us—"If I could only find this out I would be happy." Light is suddenly given to you; you say, I have discovered, I have uncovered the truth about this thing; and you are hit in the eye with this truth, and it has the same blinding effect as the burglar's lantern. It blinds you to your surroundings, and you run away and make assertions at once on that one truth, the revelation of that one group of data. You immediately draw conclusions—and that is just exactly where we make our mistake. We do not wait long enough; we do not wait until we get adjusted to our new surroundings in relation to that revelation; we do not wait to find out where we are, to see about us the different bearings of various other things upon this; we do not wait until we get the whole truth. The truth has been likened to a jewel, and the analogy is a good one. A jewel has many facets, many angles, and we cannot see all around it at one time; it requires the observation of many minds.

I do not know what is on the other side of that microscope on the president's desk. I have been looking at the back of it, and wondering what it looks like on the front side, and the only way I can get that from my point of view is to take the judgment of the president, because he sees it from a different point of view. I cannot write a description of it until I have his observation. If I attempt to describe that microscope to you from my view, the president would tell you that I was wrong, because he sees it from the other side, and knows that I am wrong. The president may attempt to describe it from his view, and we go farther astray, because he sees it only from his side. Dr. Black has spoken to you about the salutary effect of contention. The president and I would get into contention, and after a while it would develop that we had been seeing this thing from different sides; then if we put both of our observations together, after having seen all around it, we would be ready to present to you our combined observations of the microscope, and you would get something reliable. I give this illustration to show two points; in the first place, most phenomena cannot be solved by a single observation, and secondly, we want to be careful not to jump at conclusions from one point of view. In the scientific method it seems to me needful that a man should possess that characteristic which makes him careful, and not easily disturbed, not easily rattled; should develop that attitude of mind that we see in the trained soldier with regard to courage. He must have that midnight courage, so that when he is aroused at midnight and called to fight, he does not have to get ready, for he is trained to fight. The scientific method is a matter of training.

Dr. Black spoke of defective assertions made from insufficient data. I was reading recently in an old encyclopedia, and in it I found a definition of the word definition. Among other things, it said that a definition must include everything that a thing is, and exclude everything that a thing is not. That is what we have to do to get the truth of any problem. We must include everything that the thing is, and be careful to exclude observations that are not distinctly relative.

In regard to the story about the A. C. E. mixture, and the loss of much time in chasing things we should know about: If these men had studied carefully the fundamental principles of these things; if they, in searching for a new property, had only known as much as is known today about fractional distillation—that is, that the conversion of the alcohol, chloroform, and ether would be in the order of their density—they would never have attributed to the compound the properties of all the ingredients used separately. And it would have made the masses of us a little more careful in giving compounds of substances of which we knew the ingredients were dangerous used separately.

I agree with Dr. Perry as to the value and importance of this paper, although I do not agree with him as to the question of imagination having no place in science. One of the most important characteristics of the scientific man is that he should have an imagination, that he may create images of the things he is looking for.

I am very glad to have heard this paper, and I hope that it will tend to direct our energies in the line of study spoken of by Dr. Black, and that this study will tend to rid us of any feeling that there is a difference between the scientific and the practical; will lead us to know that the scientific is the practical, the most practical.

Dr. Black (closing the discussion). I have very little to add to what has been said in the paper. I would like to say a word or two that I did not say in the essay, that is, in deprecation of the tendency of men to reach conclusions from single observations, or to run after will-o'-the-wisps when they should not. I also see excellent men occasionally who are running in circles; that is, they tell what they know of a subject or thought, then in another paper they tell it again in other words but with no additional facts, and repeat this time after time. They are simply circling around a problem which interests them, but of which they seem to have learned no more than was developed in their first paper. I wish heartily when I see men doing this that they would drop the whole thing and take up something else, until a time came when they could go farther.

(To be continued.)

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Thirty-seventh Annual Union Convention.

(Continued from page 946.)

WEDNESDAY—*Afternoon Session.*

THE meeting was called to order at 2 o'clock Wednesday afternoon by the president, Dr. C. C. Bachman.

A communication was then read from the Sixth District Dental Society of the State of New York inviting the Seventh and Eighth District Societies to combine with them in holding a union meeting in 1907 at Binghamton.

Dr. W. A. White moved that the invitation be accepted.

The motion was carried.

A communication was read from Dr. Ellison Hillyer of Brooklyn, correspondent of the New York State Dental Society, calling the attention of the district societies to the paper presented by Dr. J. P. Buckley of Chicago before the annual meeting of the New York State Dental Society on "The Chemistry of Pulp-Decomposition with Reference to the Discoloration Problem; and a Rational Method of Treating These Conditions." In this paper the use of tricresol is advocated, and it was requested of the different members that they make a clinical report at the annual meeting on the use of this agent.

Dr. F. M. WILLIS, Ithaca, called the attention of the society to an objectionable press notice in one of the morning papers, and offered the following resolution:

"RESOLVED, That it is the sense of this meeting that press notices of the dental meetings like the one cited are not in accord with the dignity of our profession, and that we further request that the officials of the society where these meetings are held see the reporters and have the press notices in full accord with the dignity of the dental profession."

The resolution was adopted.

The next order of business was the reading of a paper by Dr. S. E. MACDOUGALL, Buffalo, N. Y., on "Gold Fillings *versus* Porcelain Inlays," as follows:

GOLD FILLINGS *versus* PORCELAIN INLAYS.

Some twenty-five years ago there was a new departure in dental practice that stirred the profession as nothing else has done in half a century. Dr. J. Foster Flagg and others advocated the use of amalgam in a large percentage of cases, and made the claim that "gold in proportion as a tooth needs filling is the worst material to fill it with." There is such a large element of truth in this statement that amalgam and the plastics have come into common use, although they do not fill the requirements of an ideal filling material to any greater degree than does gold. Amalgam possesses certain characteristics that in many cases will recommend it in place of gold, namely, ease of manipulation, and the saving of time, strength, and expense to patients. Cheapness of operation is often deplored as having a tendency to lower the professional standing of the dentist, but the fact still holds good that if gold alone were to be used it would preclude a large class of people from dental operations, either on account of expense or lack of vital strength to withstand long, painful operations; and for the reason stated plastics will always be used to a greater or less extent as furnishing "the greatest good to the greatest number."

Gold has had a long and eventful

career as a filling material for teeth, as its history can be traced back to the teeth of mummies found in the Egyptian tombs, and to those of victims buried in the volcanic ashes of Pompeii.

The long use of gold as a precious metal for money, jewelry, and ornamentation has cast a charm around it that seems to hide some of its defects as a filling material. It has held first place in the finer dental operations for the simple reason that no material was found in which was combined a greater number of qualifications until porcelain and its manipulation became better understood and appreciated. A struggle, analogous to the one enacted a quarter of a century ago, is now being waged between the gold advocates and the porcelain enthusiasts. Porcelain workers are enthusiastic over the art, as it appeals to the artistic taste as no other material has ever done.

An ideal filling should have three prominent characteristics: (1) Sufficient strength to resist the stress of mastication, and in exceptional cases the impact of certain hard substances, like a little piece of bone, etc. (2) Compatibility to tooth-structure and surrounding tissue. (3) Close approximation to the tooth in appearance so as to present normal or lifelike aspect. Gold fills one of these requirements—sufficient strength—but it lacks the other two essentials. It conducts every thermal change to the pulp when placed anywhere near it, and its electrical conductivity is so good as to convert the mouth into a small storage-battery plant when placed near other metals. As an esthetic filling material its most devoted advocates place a limitation on its display, and we may add that in the proportion a tooth needs filling, just in the same ratio is a tooth disfigured when filled with gold; were it not so a large gold crown on a central incisor would be "a thing of beauty and a joy forever."

Other factors to be taken into account in performing an operation are the vital strength of the patient, his susceptibility to pain, and the vitality of the teeth operated on. To successfully fill a large cavity with gold, so as to make a fairly permanent operation, often necessitates the cutting away of so much tooth-structure as to weaken the tooth to a point where it is liable to fracture during mastication if brought into sudden contact with a hard substance, and such a large mass of metal in close proximity to the pulp often causes great discomfort, or even its devitalization. Some of the most beautiful operations that it has ever been my pleasure to witness were performed by members of the G. V. Black Dental Club at the clinics of the National Dental Association held in Buffalo during July 1905. The work was absolutely perfect, and done by some of the most skilful exponents of the dental profession, and yet as ideal fillings performing the mission for which they were intended, they are nearly complete failures. The teeth respond to every thermal change, which eventually induces pulpitis, and there is a continual consciousness of an abnormal condition present, which unless the teeth possess an unusual degree of vitality, will cause the pulp to surely die. The principle on which these fillings were built is correct, but the material is at fault.

The practice of extension of a cavity for the prevention of recurrent decay is correct if it is not carried to extremes; when extension is carried beyond a certain point the object of non-recurrent decay may have been attained, but the tooth rendered so frail as to fracture during mastication, or the pulp may become devitalized through thermal changes. Let us take for instance a bicuspid with an approximal cavity which was drilled between the cusps, cutting out a channel in the sulcus too near the center of the tooth. This groove weakens the tooth greatly, and should a cavity occur on the opposite side of the tooth, by following the same principles of cavity preparation as in the first case a channel will have been cut completely through the tooth, leaving simply the buccal and lingual walls standing with no support from each other, and consequently a fracture is liable to occur at any time.

Porcelain can be placed in these cavities without weakening the tooth, as in using this material it is not necessary to cut half of the tooth away in order to obtain the necessary anchorage, and there will be no effect from thermal changes. The discomfort, pain, and fatigue that a patient is subjected to by one of those extensive gold operations would preclude its insertion, except in patients the strongest and least susceptible to pain, and in this connection we should not lose sight of the fact that the dentist himself has his own vitality on the rack in performing so prolonged an operation. Porcelain has all the requirements of an ideal filling material. It has sufficient strength to withstand the stress of mastication, as is proved by the artificial teeth worn for twenty years or more in mouths with strong jaws, and also by the porcelain fillings inserted in the natural teeth. It is certainly more resistant than many of the teeth that are mutilated in order to obtain the anchorage required for gold fillings.

A gold filling is not an element of strength in a tooth, as it simply acts as a plug held in place by contact with the walls of the cavity; while a porcelain inlay strengthens a tooth—especially when the walls are thin and brittle—by its union with the walls of the cavity through the cement. It is claimed that the cement is the weak point in the porcelain inlay operations, whereas it is the strong factor, the tooth being rendered much less liable to fracture.

Dr. Black's tests on the degree of pressure which the human jaws can exert is often taken to prove that porcelain has not sufficient strength to withstand mastication, but in my opinion his tests do not prove the point, and have little bearing on the case. They show that man is capable of exerting from sixty to two hundred pounds' pressure with the teeth. No one ever uses any such pressure on the teeth unless a bone or some hard substance is unexpectedly encountered. In such cases a tooth containing a large gold filling will break as quickly as a porcelain inlay. In the former case it will be the tooth which breaks, while in the latter it may be the inlay, which of course can be replaced. On the other hand, a split tooth is a very difficult condition to remedy.

To demonstrate in the simplest manner that no great force is used in ordinary mastications, or any such force as is mentioned by Dr. Black, count the number of times that the jaws move in chewing slowly, say about fifty times a minute, which is not too fast, as can easily be demonstrated by timing oneself. If we take forty times a minute and multiply it by 25 lbs. to a bite, it gives us 1000 lbs. muscular exertion in a minute; consequently a meal lasting thirty minutes would mean an expenditure of 30,000 lbs. muscular exertion. This amount of muscular energy is never used in eating, for when chewing the force is distributed over a surface of from two to four teeth, thus dividing the amount of force on each tooth.

To summarize, gold is a disfigurement to the teeth just in proportion as it is visible, and a discomfort in proportion to its size and nearness to the pulp. Its use sacrifices good tooth-structure, produces a painful operation, and wearies the patient; therefore only the strongest can endure these long operations without ill effects. Porcelain strengthens the tooth; has no thermal or electrical conductivity; is a source of comfort to the patient, and is esthetic in appearance, being a close imitation of nature's handiwork. It requires time to master all of its peculiarities; but gold also has its eccentricities, and it is very seldom that a mouth can be found where much gold work has been performed, even by the best operators, without finding considerable of it defective. A little gold may have scaled off, the cervical margin may not be quite perfect, or a thin wall may have been fractured. I have seen these defects in the mouths of people who are under the care of competent dentists. If a porcelain inlay is not found to be absolutely perfect, just remember that a few defects do not condemn the practice.

Objection is raised that the inlays do not always match the teeth in shade, but the poorest match in shade is less of a disfigurement than the most perfect gold filling. With a conservative use of porcelain a mouth can be brought into a more healthful, comfortable, and beautiful condition than with any other material: Crowns can be made to approximate the natural teeth so closely as to defy detection, and carious teeth may be rendered as beautiful as when they first erupted.

The first impression, and one that seems to obtain with many, is that porcelain is restricted to a few cavities in certain places in the mouth, but as one develops the art the more he is impressed that such is not the case, it really being unlimited in its application, and only circumscribed by the limitations of the operator.

Discussion.

Dr. B. S. Hert, Rochester. In the first part of his paper the essayist goes back some twenty-five years to the time of the "new departure," when Dr. Flagg and others advocated the use of amalgam in place of gold. At that time the claim was made that gold in proportion as the teeth needed filling was the worst material to use, and Dr. MacDougall indorses this idea by saying that there is a large element of truth in it; but he immediately afterward says that amalgam does not fill the requirements of the ideal filling material any more than gold does. If that be the case, it seems to me the statement should read that in proportion as the teeth need filling, gold and amalgam are the worst materials to use. He also makes the statement that gold has held its place in our finer operations. If it is the worst material to use, it seems strange that it should have held first place from the time of the new departure to the present. He also says that gold has had a long career, as shown by its presence in the mouths of mummies found in Egyptian tombs. These mummies must have been over twenty-five hundred years old, and I think any filling material which will last that long is a pretty good material to use in the teeth even now. The essayist says that the ideal filling material must have three prominent characteristics, viz, strength, compatibility to tooth-structure, and color. Gold, he states, fills only the requirement of strength; that it conducts every thermal stimulus, and that it converts the mouth into a storage battery when placed near other metals. The author also says that in proportion as a tooth needs filling, just in the same ratio is the tooth disfigured when filled with gold. If he makes this applicable only to the anterior teeth it might hold good to a large extent, but it does not apply to the posterior teeth. In such places I think it is the best material available for preserving the teeth. He speaks of the work done by the G. V. Black Dental Club at the National Dental Association meeting as being a failure. I saw that work, and I think there were some twenty-five fillings placed in at that time, and I would like to ask Dr. MacDougall how many of these fillings he has seen since?

Dr. MacDougall. I have seen three in the mouths of dentists who said they would never for any consideration go through the ordeal again.

Dr. Hert. It seems to me that three fillings seen since that meeting would be hardly sufficient warrant to pass condemnation on the method. Dr. MacDougall says that the work was perfect, but as demonstrations of an ideal filling material they were nearly all failures. I think that a strong assertion to be made by anybody who has seen only three of these fillings out of a total of twenty-five. I know of a few of the fillings placed by members of the G. V. Black Dental Club, and the patients have no complaint to make either as to thermal changes or any other abnormal uncomfortable condition.

In referring to the preparation of cavities as practiced by the members of the G. V. Black Dental Club, and as advocated by Dr. Black, he mentions a bicuspid with an approximal cavity having been drilled between the cusps to cut a channel in the sulcus, too near the center of the tooth, and says that this weakens the tooth greatly, and that if the same principle were followed out on the opposite side, a channel would result, running completely through the tooth, and leaving simply the buccal and lingual walls standing with no support, in which case fracture is liable to occur at any time. I do not think he understands Dr. Black's methods as I do. If he does what the essayist claims, it is because the teeth have decayed extensively, and not in order to practice extension for prevention.

Take an average approximal cavity in a bicuspid, where decay does not extend very far toward the buccal or lingual wall. If the cavity is to be prepared on the principle of extension for prevention, with no cavity present in the occlusal surface, make a broad shallow step between the cusps of the bicuspid, which weakens these cusps but very little. The step is not made so deep as to harm the tooth. If the latter has a live pulp, it does not result as Dr. MacDougall says, in a buccal and lingual wall without support and liable to fracture, for there will be a large portion of dentin there which will support these walls, and it will be a great many years before one may have any trouble from that source.

Porcelain, he says, has all the requirements of an ideal filling material. The essayist objects to the use of gold because of the necessity of extensive operations, but that is equally as true of porcelain as it is of gold. Another great objection to porcelain is its friability; it is weak along the edges. He says that porcelain has sufficient strength to stand the stress of mastication; that this is proved by the artificial teeth which have been worn in the mouth for twenty years. That I think proves nothing. Dr. Black has shown that with a plate of artificial teeth it is never possible to produce the amount of force that it is possible to obtain with the natural teeth. The stress of the plate I think is limited to fifty pounds, while the stress of the natural teeth runs as high as three hundred pounds, and even then it is only limited by the soreness along or around the roots of the teeth, and not by the strength of the tooth. He also does not agree with the tests Dr. Black has made in regard to the amount of pressure exerted by the natural teeth, being from sixty to three hundred pounds. I do not think Dr. MacDougall understands what Dr. Black claims in this statement. If he had a better understanding of physics, he would probably understand what Dr. Black means. Some years ago, in a discussion of this subject in Philadelphia, a number of dentists spoke along the same line as the essayist, and the editor of the *International Dental Journal* submitted Dr. Black's tests to an engineer, who said it was entirely within the bounds of reason that a person should be able to exert that amount of pressure with the teeth. It is simply through a misunderstanding that dentists misinterpret Dr. Black's figures.

Dr. MacDougall says that porcelain strengthens the teeth, while gold does not. If gold be inserted in a cavity prepared according to the method of Dr. Black, and put in carefully, it seldom, if ever, cracks the walls, and I do not believe that it weakens the teeth. Porcelain is cemented in, and there is a slight attachment between the tooth and the cement, and if that tooth is strained it will crack with porcelain in it just as readily as it would with gold.

In the latter part of his paper the essayist speaks of the conservative use of porcelain. He says the mouth is brought into beautiful condition by the use of porcelain, and that its application is only circumscribed by the limitations of the operator. It would seem that his idea of the conservative use of porcelain would be to use it everywhere. I do not feel that conservatism in this direction implies that it should be used in every part of the mouth and in all teeth. I would like to ask Dr. MacDougall how long he has been using porcelain as a filling material?

Dr. MacDougall. A little over a year.

Dr. Hert. I have used porcelain for three years, and I do not feel competent to judge of its lasting qualities. During this time I have come to think of it as the best material to use in the anterior teeth, but I have no reason to judge from my experience that it is of similar value in the posterior teeth. Men who have used it for ten and twelve years; men who are careful operators; men who understand the filling of teeth with gold and porcelain, say they do not use it in the posterior teeth; that gold is still the best material in these places. I have placed some, but not a great many, fillings of porcelain in these teeth, and think it is wise for us to follow the advice of the expert operators in this work until we can see the results of our own trials in these locations, and satisfy ourselves whether or not it is the most desirable material to be used in those places.

Further discussion of Dr. McDougall's paper was postponed until the reading of the next two papers on the program, when all three might be discussed together.

The next paper was that by Dr. J. A. Sherwood, Buffalo, N. Y., on "Cavity Preparation and the Shading and Setting of Inlays," as follows:

Cavity Preparation and the Shading and Setting of Inlays.

So much has been said and written upon the subject of porcelain inlays that it would seem that all our practicing dentists were thoroughly familiar with the subject in all its details; and yet from personal observation I have come to the conclusion that porcelain is being used as a filling material to a very limited degree, some using it in a very narrow field and the majority not using it at all. This I think we can attribute to the dentist's ignorance of the method of operation, and yet it is surprising how very little effort is being put forth to learn more about it. There is no question that porcelain today stands side by side with gold and amalgam as a material for restoring lost tooth-structure, and in many cases it far surpasses them in usefulness; and yet even in our largest centers of population, where opportunities for the use of porcelain are many, it is ignored by dentists of supposedly good standing and large practice. Porcelain judiciously used and properly placed is the best filling material the dentist has at his command, and he who does not use it does not render to his patients the best possible service.

It is not my intention in this paper to describe or even outline the *modus operandi* in filling with porcelain, but only to reiterate some of the details of certain of its phases, and to try to impress upon those who do this work some principles which if closely followed will bring about better results. Let me divide the paper into three heads, viz, (1) "Preparation of Cavity; (2) Shading of Inlay, and (3) Setting of Inlay."

PREPARATION OF CAVITY.

Under the first head, one of the most important rules which must be followed in dealing with approximal cavities is—Plenty of room for the removal of the matrix and the insertion of the inlay. I speak of the approximal cavity here because it presents more difficulty and more detail to be considered than does the simple labial cavity. To secure sufficient space, apart from any previous natural separation of the teeth, the cutting away of the enamel wall of either the lingual or labial plate is absolutely essential. It is much better to have a good fitting inlay from a well-formed matrix than a poorly fitted inlay from a distorted matrix, when you may produce the former by cutting away the cavity wall instead of trying to save it. Again, in this connection, always determine upon the removal of the matrix in a certain direction, and cut the cavity walls so that the removal of the matrix in that direction will be facilitated. In these two points make the removal of the matrix as easy as possible.

We have been told by a great many who are experts in porcelain work, and more particularly by those who use low-fusing porcelain, that the cavity should be shaped so as to give the matrix that form which will make its withdrawal from the cavity an easy operation. This has been very misleading, and has led to many variations in the shaping of cavities. It has also led to many failures in inlays that have come out after having been cemented, and is responsible for many imperfect margins—the latter being due to displacement in setting because of the shape of the cavity.

You will notice that in speaking of the separation and cutting away of the enamel walls to facilitate the removal of the matrix, I have said that we should endeavor to make such removal as easy as possible, but this does not apply to the shaping of the inside of the cavity. Instead of making the inside of such a shape that the matrix may be removed or withdrawn as easily as possible, shape it so that the matrix may not be so easily withdrawn. To make the cavity of such a shape that the matrix may be withdrawn easily, only means that the completed inlay will be likewise easily dislodged. You are told to make no undercuts in the cavity. Often an undercut may be made without interfering with the easy withdrawal of the matrix in good form, and an inlay made from such a matrix will not come out after it has been inserted. In cavities of the interproximal space, I nearly always try to have an undercut in the gingival wall, and thus instead of having the gingival wall at right angles to the bottom, or pulp-wall of cavity, I secure more of an acute angle.

Only one point more under this head of cavity preparation, and that is to make the floor of the cavity flat or of some decided shape, so that the inlay when being set will not shift from side to side and cause imperfect margins because of malposition of the inlays.

SHADING OF INLAY.

In discussing the second heading, viz, the shading of inlays, let me say that I believe that this part of porcelain work is the one least understood, and the one which receives the least attention from those doing the work; and yet the proper shading of an inlay so as to match the tooth-structure constitutes about one-half its merit.

No tooth is entirely of one color, and very seldom are we called upon to make an inlay in which there is only one color. There is one basal principle to be remembered in the shading of an inlay, viz, that the tooth is composed of different structural parts, dentin and enamel, and that it takes its color chiefly from the underlying dentin. The color is reflected through layers of enamel of varying thicknesses, thus giving the tooth variation of color—one blending into the other from the gingival to the incisal portion. Consequently one must produce in the inlay a foundation corresponding to the lost dentin. Over this must be laid the enamel of the colors that are present in the tooth from the gingival to the incisal areas—or in whatever direction the inlay follows. To produce the most artistic results along this line there is in the opinion of the writer no porcelain so admirably adapted as Brewster's. It is composed of a foundation body of three basal colors which correspond to the dentin, and the enamel in a variety of shades to be placed over the foundation body.

In this connection allow me to speak of the XX enamel, which is a separate Brewster product, and which having a lower fusing-point than the other, and being more translucent, is admirably adapted for reproducing an incisal portion or corner of a tooth, or in fact any portion having a highly translucent surface. These porcelains are compatible one with the other, and when an inlay is made by using the foundation body first, fusing over this the enamel, and finally finishing with the XX enamel, a beautiful result is obtained.

SETTING OF INLAY.

And now a few words about the setting of inlays. Many inlays are spoiled in cementing them into place. The reason for this is in the opaque cement, which instead of transmitting light reflects it. A similar condition results when a metal backing is placed on a thin porcelain facing. The inlay when set appears darker, and does not match the tooth. Thus it is often better if the inlay is somewhat lighter than the tooth before cementation.

For some months I have been using for setting inlays Ascher's artificial enamel, and so far it has proved more than satisfactory. It is translucent, and does not reflect the light, so that the inlay when set with it remains the color it was before setting. Then again there is no apparent line of demarkation between the inlay and the tooth. It apparently has good adhesive quality, and—for the setting of inlays at least—it seems far superior to cement. It is placed on the market in six colors, and, like cement for inlay work, should be mixed with an ivory or bone spatula, so as to prevent discoloration of the material.

Under the three heads which I have taken up briefly there could be much more said, but in what I have presented, if I have thrown out any thought which may be of help to someone, my effort in bringing the subject before you will not have been in vain.

Discussion.

Dr. W. W. SMITH, Rochester. I think we have many conservative men in the profession, and believe I am ordinarily conservative in my practice, but I know that I have been in error in going beyond my skill in the use of porcelain. I wish to state, or restate, however, that I believe the limitations of porcelain are bounded only by the limitations in the skill of the operator and the ability of the patient to pay for that skilled service. I do not know, but I think we will all admit that porcelain is the ideal filling material. I think no one will question that. It is only a matter of adapting it to the different conditions as found in the teeth, and of becoming so skilful in its use that we may obtain perfect results.

The statement has been made—or rather a quotation from a statement made several years ago—in regard to the use of gold, namely, that in proportion as teeth need filling, gold is the worst material to use. I think I am prepared to change it so that it will read that in proportion as teeth need saving, porcelain is the best material to use.

The essayist spoke of the separation of teeth. That applies, as I understand it, simply to the anterior teeth. It is not necessary in the posterior teeth, as it is impossible, or rather impractical, to secure sufficient separation in some teeth to make the use of porcelain practical, and yet by the proper cutting away of the teeth—and I have no criticism to make of Dr. Sherwood's method of cavity preparation—the removal of the matrix can be very much facilitated, and with little loss of tooth-substance. The essayist did not speak of this point in his paper, which of course applies to the anterior teeth. He extends the cavity either on the labial or palatal surface, according to the requirements of the case; then if the matrix is to be removed from the front, instead of burnishing down the platinum to the tooth, it is simply burnished to the cavity proper, and then brought as close to the edges as possible, leaving a slight margin over the cavity on the opposite side from which the matrix is to be removed. I presume that the essayist does this, though he did not mention it in his paper.

In regard to the preparation of cavities, I feel very sorry that Dr. Sherwood did not go more into detail. The matter of having a decided seat for the inlay is of considerable importance. I think more of my failures and those of other operators have been due to disregarding this requirement, and making cavities of an oval shape, than to any other cause. I think the essayist spoke of the matter of displacing inlays during the cementation process. That is another point in favor of having the decided seat for the inlay, which should apply particularly to labial cavities. I think more labial porcelain inlays are displaced by pressing them into position when cementing them to place because of the lack of carrying out this principle, than from any other cause. Wherever the cavity is located, it should have a decided floor and decided angles, so that there will be no question as to accurate setting of the inlay.

Nothing has been said of the posterior tooth, but the same principle will hold good in regard to preparation of cavities in these teeth. In a great many cases, however, in bicuspids and molars, and in compound cavities at the cervix, instead of having a flat or right-angle floor, one at an acute angle should be preferred, as thereby the cavity is made much stronger.

The essayist said nothing regarding

the matter of occlusion, which is of great importance, particularly in the posterior teeth. Many inlays I think are ruined by having the point of contact at the joint between the inlay and the tooth. For instance, in a molar, upper or lower, if the tooth is badly decayed, to have the point of contact at the joint between the inlay and the tooth would be very hazardous to the inlay. I should cut the tooth-structure more, and supply the deficiency with porcelain, so that the occlusion would be upon the porcelain instead of on the tooth.

I do not quite agree with the essayist in regard to the making of the inlay lighter than the tooth, and looking for a darkening of the inlay in the setting. I think this darkening in the setting is ordinarily bleached out, leaving the color of the inlay as it originally was.

I have had no experience in the use of Ascher's enamel, but I have been very much interested in it. Dr. Sherwood believes it shrinks considerably, but I think opinions differ on this point. I have used Harvard's cement and have the twelve different colors and the shade guide, and I can usually match the teeth very closely by using one color or mixing two or more. If the tooth-walls are not thin enough for the cement to show through, I usually use white, and have had better results in that way. But in cases where the wall is thin, I match the tooth as nearly as possible with the cement. I have been using for two or three months Brewster's matrix lining, which is white. This is opaque, and the cement does not show through it. In using this it is necessary to use a darker color in order to allow for the white, which will modify the color.

I think what the essayist has said in the paper about shading is very good. I have no criticism to make, except in the matter of using XX enamel body. I used this two or three years ago quite considerably on incisal edges of the teeth, it being so nearly translucent or transparent, but it is a very brittle material, and I have entirely discarded it in my practice. In some cases, however, it works nicely.

Further discussion of Dr. Sherwood's paper was deferred until the reading of a paper by Dr. J. Q. BYRAM, Indianapolis, Ind., on "The Preparation of Cavities and the Selection and Application of Porcelain Inlays."

[This paper appeared in full in the *International Dental Journal* for August 1905.]

Discussion—continued.

Dr. JOHN Q. BYRAM. Dr. MacDougall in his paper stated that the limitation of porcelain was only governed by the ability of the operator. Now, I wish to say that such statements do considerable harm to porcelain work, and I would say to Dr. MacDougall that in less than five years he will be glad to retract that statement, for this is true of many who made the same statement a few years ago. He says that porcelain does not transmit thermal changes. Theoretically it does not, but practically it does to a slight degree.

I would like to reply to one of Dr. Sherwood's remarks at this time. He said that it was not advisable to build porcelain of one manufacture over that of another. My experience has been different. I grant you that if you take porcelain known as block body, and attempt to work porcelain which fuses at the approximate point of Brewster's enamel and of a different texture and shrinkage, you will find that it is difficult to do; but you can work Brewster's enamel over White's body just as well as over Brewster's foundation. I sometimes fuse Jenkins' enamel over Brewster's enamel when I find I need to make a change.

Dr. MACDOUGALL (closing the discussion of his paper). There seems to be a little misinterpretation as to my paper. When I spoke of the conservative use of porcelain, Dr. Hert inferred that I meant to use it in every cavity in the mouth. Now that is the extremist's view, and the extremist is not a safe man to follow, which is what I endeavored to show when I mentioned the work done by the G. V. Black Dental Club. I tried also to show you that a porcelain filling in a cavity would conserve that tooth better than any other material which would render that tooth comfortable. I also tried to prove that a filling material should have three characteristics to make it an ideal filling material, namely, strength, compatibility of tooth-structure, and beauty. Porcelain has these three characteristics, while gold has only one. Again, I tried to show the comparison between the preparation of cavities for the two materials. I do not believe in cutting away or sacrificing tooth-structure except to prevent recurrent decay. Some of the fillings I mentioned, which were inserted by the members of the G. V. Black Dental Club, required as long as four hours to complete the operation; some of these fillings were in the mouths of strong men, some of whom have told me that they would not for any consideration go through the ordeal again. A number of the teeth are sore and responsive to thermal changes to this day.

I tried to show that porcelain did not respond to thermal changes, but Dr. Byram says it does. The latter seemed to take exception to my claim that porcelain strengthens enamel, yet right in one of his cases he shows a cavity extending nearly to the incisal edge, and he says not to cut that corner off, but to put porcelain under it and it will stand. With regard to the conductivity of porcelain—I did not claim that it was absolutely nonresponsive to thermal changes. We cannot place anything in the mouth that will not give rise to thermal changes, but I claimed that porcelain was less conductive than any other substance, and there is consequently less irritation from it than from any other material we can use.

Dr. W. W. BELCHER, Rochester. I would move that a vote of thanks be extended by the society to Dr. Edington, chairman of the Essay Committee, for the admirable program he has given us; and I would also include in that a vote of thanks to the essayists.

The motion was carried.

Dr. GRISWOLD moved that a vote of thanks be extended to the exhibitors for their co-operation in making the meeting a success.

The motion was carried.

Motion was then made and carried to adjourn until 7 o'clock P.M.

WEDNESDAY—*Evening Session.*

The evening session was called to order at 7 o'clock P.M. by the president, Dr. C. C. Bachman.

Dr. H. A. PULLEN, Buffalo, N. Y., gave a lantern exhibition showing the advantages of early interference for the correction of irregularities of the teeth. He also showed a number of cases treated and the beautiful results obtained.

The meeting then adjourned to the Masonic Club, where a luncheon was served to the members and guests of the societies.

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Devoted to the Interests of the Profession.

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PHILADELPHIA, OCTOBER 1906.

EDITORIAL DEPARTMENT.

THE SAUCE TO THE PUDDING.

THERE is a characteristic of the dentist, taking him as a class, which has always been of curious interest, and that is his sustained enthusiasm for his professional work. A noted musician once said that of all the callings with which he was familiar, music was the only one that a man could pursue all day as a means of livelihood and then get his recreation and amusement out of it at night. Dentistry, however, is apparently regarded by many of its devotees in much the same light, for who has not had the experience of meeting men evidently physically tired and mentally worn with the drudgery of office practice or a season's hard labor at the chair, who seemed to find their chief recreation and mental relaxation in discussing modes of operating, some new wrinkle in practice, or the intricacies of dental pathology—or, more wonderful still, by attending a round of dental meetings during the only vacation period which they allow themselves, and actually finding it a vacation.

If one merely regards the large number of dental meetings held during the year in the localities where dentists are relatively numerous, the marvel is that the interest can be so sustained, especially in view of the effort which is evidently necessary in order to secure desirable material for their programs. The dental meeting, with its machinery of papers, discussions, clinics, exhibits, etc., appears to be multiplying at a rate which in the course of time must exceed the demand—a state of affairs which has already made it too easy to gain an audience for many productions in the way of essays which for the good of dentistry had better have been stillborn. The demand for program material of a high order already exceeds the legitimate supply, but the demand still continues; for the dentist must have his dentistry, and he will have it via the society, for the reason that there he can obtain it at first hand and have also the opportunity to discuss it, or criticize it if he doesn't like the quality of it or the way it is served.

But even the most intense enthusiasm cannot be counted upon to endure under all circumstances. Audiences, even of dentists whose love for their calling takes first rank over their other emotions, require in the course of time something more than a recasting of old ideas into different phraseology or epitomes of other men's views put together with a judicious selection of conjunctive sentences and wound up with a paragraph setting forth "my own opinion." The writer of "original communications" who begins his task by sending out his *omnium gatherum* in the shape of a circular letter broadcast among his colleagues to collect their views for the purpose of working them into a paper of his own which he is to "read by invitation at the next meeting of our local society," would be a greater nuisance than he is if it were not that our sympathies go out to him because he is one of the necessary creations of the ubiquitous program committee that can't help itself for the reason that we must have meetings whether there is really anything important to meet for or not.

A reaction toward fewer dental meetings, and those of a higher grade of output, is desirable. With our characteristic energy we seem to be overdoing the dental meeting work in America. We take that phase of our professional activity rather too seriously, and are not devoting as much energy and activity as we should to the production of the class of work that is really worthy of presentation in our dental meetings. A liberal advance in grade and character of ideas, and a larger element of new thought in our association work, would vitalize the whole situation and divert attention from the political aspect of our organizations, giving to politics a place of minor importance and thus remove the major incentive to the politically ambitious.

The need for a more healthful development in our larger organizations is felt and recognized by a majority of members of our profession. Many who attend do so frankly for social reasons, and because through informal social intercourse with their colleagues they derive a greater benefit than by following the various details of the program. To a very large number the social features of the meeting are the points of greatest attraction. These men attend the meetings to come into contact with their friends, not to hear papers read, for they prefer to read the papers at their leisure when printed or published. The dental profession in Europe recognizes this fact and utilizes the social factor to the practical advantage of their larger professional gatherings by giving it emphasis in their programs. In America we would do well to profit by this desirable feature in the betterment of the plan of our state and national meetings.

A typical example of the extent to which the social feature is utilized in Europe in adding to the attractiveness of the national dental meeting is furnished by the program of the forty-fifth annual meeting of the Central-Verein Deutscher Zahnärzte which convened in Dresden, August 4th–6th of this year. The program, besides the opening reception, included three luncheons, a general banquet, a general evening musical entertainment with refreshments, a railroad excursion, and a steamboat excursion with illumination and fireworks display. To all of these festivities the ladies, the wives and families of the members, were invited and participated. The expenses were met by a per capita tax of eighteen marks per member (less than $4.50 American money). Similar social features characterized the meetings of the Swiss Odontological Society and of the International Dental Federation in Geneva.

The value of this enlarged view of the social features of our more important dental meetings is a practical one in bringing out and increasing the membership, and notwithstanding the criticism that is occasionally made in this connection that the dental meeting degenerates into a professional picnic, there is still much to be said in its favor. It is worth while to combine recreation and entertainment with the serious work of the meeting, provided that a fair balance of proportion is maintained between the two, for reasons already referred to. And further, the personal frictions which too easily arise out of differences of opinion developed in debate disappear when the disputants are brought into social contact under pleasant circumstances. Our German colleagues are right in the stress which they place upon the value of *gemüthlichkeit* in their dental meetings. It is difficult or practically impossible to indulge in polemics with a comrade over a luncheon table with good music and good cheer as the accompaniments. But whether it be the *gemüthlichkeit* of the Germans, the *camaraderie* of the French, or the good-fellowship of the Anglo-Saxon, it is the quality which these terms represent that is developed by the social features of our meetings, and which is the sauce that sweetens our relationships and makes it easier to forget our differences and digest the more professional and intellectual items of the program.

CORRECTIONS.

In the article by Dr. D. M. Hitch in our September issue an error occurs with reference to two of the illustrations. Fig. 6 is a photograph of a Petri plate showing no bacterial growth after inoculation from the halves of toothbrushes subjected to the action of formalin, the descriptive inscription to the left applying to Fig. 5. The inscription to the left of Fig. 5 should be omitted, as it relates to a plate which was broken before it could be photographed.

During the absence of the Editor in Europe the report of an extemporaneous discussion on the bleaching of teeth printed at page 949 *et seq.* of September Cosmos went to press without being read and passed upon by the author, and in consequence an error of statement has crept in with respect to his views upon the principles which should govern the use of the aqueous and the ethereal solutions of hydrogen dioxid respectively for the bleaching of discolored dentin.

The misstatement is as follows (page 952): "In a desiccated tooth the ethereal solution is in my judgment the one to be used. On the other hand, when attempting to bleach a tooth with the natural moisture present I have resorted to the aqueous solution, because an aqueous solution of hydrogen dioxid is more agreeable to moisture than an ethereal one would be."

The idea which the speaker endeavored to convey is quite the reverse of the form which it took in the mind of the reporter as above stated. The ethereal solution of hydrogen dioxid, commonly known as caustic pyrozone, is preferably to be used in moist conditions of the dentin, for the reason that the affinity of pure H_2O_2 for water is greater than for ether, consequently when the concentrated H_2O_2 solution in ether is brought into contact with water the H_2O_2 leaves the ether and is taken up in solution by the water. This difference of affinity is of advantage in bleaching moist dentin, because the contained dentinal moisture serves to attract into the tissue the active H_2O_2 from its ethereal solution. In desiccated dentin the aqueous solution of H_2O_2 is preferable, because of its rapid diffusibility in that condition of the dentin, and because H_2O_2 bleaches most effectively in the presence of moisture.

EDWARD C. KIRK.

NOTICE TO MEMBERS OF THE LEWIS AND CLARK DENTAL CONGRESS.

PORTLAND, OREGON, August 22, 1906.

TO THE EDITOR OF THE DENTAL COSMOS:

Dear Sir,—Kindly publish in the COSMOS a notice to the members of the Lewis and Clark Dental Congress held in this city last year, each one of whom is entitled to a bound copy of the proceedings, that the type matter and proofs of the entire volume were destroyed in the San Francisco fire.

In one more month they would have been delivered to the members had not this catastrophe occurred. As it is, the only record of the meeting will be the memory of the greatest gathering of dentists ever held west of St. Louis. In two years more we will have another and a better one.

Very truly yours,

ARTHUR W. CHANCE.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*La Odontología,* Madrid, August 1906.]

TREATMENT OF TRIFACIAL NEURALGIA BY OSMIC ACID. BY DR. HAMMERSCHLAG.

The author has treated nine cases of persistent and severe trifacial neuralgia by means of injections of perosmic acid. In one case the pain decreased markedly, and in the remaining it disappeared entirely for periods varying from four months to four years. The technique consists in injecting 1 cc. of a one per cent. solution of osmic acid in and around the infra-orbital foramen. The therapeutic effect is noticeable in some cases immediately after the injection, but in others, two or three injections have to be performed before any improvement occurs. In view of these favorable results the author recommends that the osmic acid method be tried before resorting to surgical intervention.

[*L'Odontologie,* Paris, August 15, 1906.]

INVESTIGATIONS ON THE CONSOLIDATION OF IMPLANTED TEETH. BY M. MENDEL-JOSEPH, ASSISTANT PROFESSOR AT THE DENTAL SCHOOL OF PARIS, AND M. DASSONVILLE, VETERINARY SURGEON OF THE FRENCH ARMY.

The authors refer to the investigations of Fredel and Scheff regarding the changes following the implantation of teeth, also to the works of Choquet and Mitscherlich, stating that none of these authors have shown by actual study of histological sections the true nature of the phenomena consequent upon the implantation of teeth, both fresh and desiccated. Messrs. Mendel-Joseph and Dassonville have experimented upon dogs, extracting and replanting the premolars, the only teeth of a dog's denture which are well adapted for this purpose by reason of their straight and conical roots, which permit of their being extracted without undue injury to the alveolus. Besides, as ample space exists between the premolars and the immediately adjoining teeth, any changes occurring within the alveoli can be easily detected at the postmortem examination. The animals operated upon were anesthetized by means of intravenous injections of chloral hydrate, and after the extraction and subsequent replantation were kept under close observation for a period varying from three to eight months. Consolidation took place rapidly, if at all, and would be complete after periods of from twenty to twenty-five days. The consolidation of the desiccated teeth seemed completed a month after implantation. In no case did suppuration develop, not even in those cases in which the results of the implantation were absolutely negative. For weeks after the implantation had been performed, the animals were carefully nursed and fed. Following the death of these animals, the fragments of the maxilla bearing the implanted teeth were dissected at once, and fixed in a solution of formalin during twenty-four hours, and stained by Van-Giesen-Weigert stain.

For purposes of comparison the sections were always made to comprise a sound undisturbed tooth besides the implanted one. In the study of the anatomical phenomena which determine the consolidation of implanted teeth, it becomes necessary to make a differentiation between the implantation of a freshly extracted tooth and that of a desiccated tooth implanted long after its extraction. In the former case the implanted tooth retains a great many of its biological characteristics, and some of its tissues participate in the consolidation; but in the latter it acts like an inert body and is held in place only by virtue of the activity of the surrounding tissues. Consequently the authors have considered it advisable to divide the subject into two large groups: Implantation of live teeth or bioplantation, and implantation of dead teeth or necroplantation.

INVESTIGATIONS OF BIOPLANTATION.

The phenomena which develop upon the implantation of a recently extracted tooth depend mainly upon the condition of the pericementum. Experimentally, by extracting and immediately replanting a sound tooth, it is possible to obtain complete regeneration of the pericementum. Clinically this may occur when a sound tooth is extracted by mistake and replanted without delay.

Bioplantation is resorted to particularly under the following prevailing conditions: (a) In the presence of complications of deep caries, such as abscesses, and fistulæ when the affected teeth resist the usual treatment. (b) When a freshly extracted tooth is to be transplanted into a natural or artificial alveolus.

As in the former case it is often necessary to remove a portion of the pericementum, and in the latter adaptation of the root to the alveolus is never perfect, a portion of the pericemental membrane is thus deprived of functional activity. In order to pursue the investigations in a way that would imitate as closely as possible the conditions occurring in actual practice, the authors implanted some teeth from which portions of the membrane were previously removed, and others from which the entire membrane was dissected away. Altogether nine experiments were made, which they divide into four different classes:

(1) *Replantation of Sound Teeth.* Four such teeth were replanted. In one case the tissues between the surface of the tooth and that of the alveolus differed in no way whatever, as shown by the author's micrographs, from the tissues between the surface of the root and the alveolus of the neighboring tooth, which was not disturbed at any time. The regeneration of the pericementum was complete throughout its entire extent.

Unfortunately, however, all cases of immediate replantation do not become so thoroughly consolidated, and more frequently the ligamentous tissue is only partially regenerated. In such cases it is observed that the cementum and dentin disappear in several regions of the root, and that the excavations thus formed become filled with new tissue. At such points the structure of the pericemental membrane loses its identity, the fibrous tissue being substituted by embryonal cells in an active state of proliferation. These anatomical changes may occur at any point of the alveolo-dental region between the apex and the neck of the tooth. In some of the histological sections exhibited by the authors, the changes which occurred in the apical region of the implanted tooth were especially striking. The cement appears corroded and resorbed to a considerable depth, the process being comparable to a rarefying osteitis, it being, as a matter of fact, what might be properly designated as a *regressive cementitis.* Throughout the affected region semicircular grooves representing Howship's lacunæ are to be seen, and in the floor of the grooves are massed osteoclastic cells in considerable number. The tissues of the alveoli appear similarly affected. It seems advisable to remark in this connection that the changes above alluded to correspond to a process of substitution rather than to one of elimination. In the neoplastic masses located near or at the areas of tissue destruction, ample evidence is found of an active fibrous and osseous organization. Gradually the cement and dentin disappear, and are substituted by the fibrous and osseous formations. If the implanted tooth is not to become consolidated, profound and generalized lesions are observable. Among the four cases of Class 1, one such instance was observed, and in this the process of corrosion and resorption without substitution was indeed unusually active. A fact of exceptional clinical value, which in connection with this series was observed by the authors, points to the necessity of maintaining the implanted tooth as immovable as possible; for the consolidation process is decidedly if not permanently delayed if the organ be subjected to functional or accidental traumatisms.

(2) *Replantation of Teeth Deprived of a Portion of the Pericemental Membrane.* The pericementum around the distal half of an extracted tooth was removed prior to the implantation; consolidation occurred in normal time, and a post-mortem histological examination of the root revealed absolutely no trace whatever of the injury to the membrane, thus showing conclusively that the

pericementum may regenerate even after accidental or pathologic partial destruction of its structure. The root was found enveloped by a tissue presenting the same histological characteristics as the normal membrane, and no difference whatever could be discovered between the undisturbed half of the root and that from which the membrane was removed. The same resorptive process as in the cases previously described could be detected; but contrary to the authors' expectations they were not so marked, although better localized. This case upsets the opinion held by Magitot and others that teeth deprived of a portion of the pericemental membrane cannot be successfully replanted.

(3) *Replantation after Complete Removal of the Pericemental Membrane: Three Cases.* None of these cases gave positive results, as all the implanted teeth were rapidly exfoliated and accidentally swallowed by the animal. This, however, should not be taken to imply that teeth deprived of their pericemental membrane cannot be implanted, for in subsequent experiments by the authors several cases of necroplantation succeeded admirably well. They are of the opinion that the cause of failure with implanted devitalized teeth is due to a faulty adjustment of the root to the alveolus, or in other words, to incomplete contact between the root and the alveolar walls.

(4) *Replantation of a Tooth in which a Portion of the Pericemental Membrane was Substituted by a Shred of Periosteum.* This case was not followed by consolidation, and as with the three cases of the previous class, the tooth was exfoliated soon after the implantation.

Regarding the behavior of the pulp, the authors refer to the studies of Fredel and Scheff, who are of the opinion that the pulp invariably undergoes a necrotic process, Scheff being especially affirmative in this respect. However, the results of the investigations by the authors of the present study point to the possibility of pulp-restoration taking place, and consequently this phenomenon, although not a constant occurrence, cannot be considered within the range of impossible phenomena, when the operation has been performed under strictly aseptic precautions. In two cases the pulp-chamber and root-canal were found empty; in one case the pulp of the implanted tooth presented identical characteristics to that of the pulp of the immediately adjoining normal organ, and lastly, in one case the pulp showed evidence of fibrous degeneration. In the latter case, in addition to vascular degeneration, there was coagulation-necrosis of the blood constituents and infiltration of the whole mass by leucocytes. It should be added in this connection that the experimental technique followed by Scheff was different from that adopted by Mendel-Joseph and Dassonville. While the latter replanted the teeth immediately after extraction, Scheff would first immerse the tooth in a solution of mercury bichlorid for three minutes, and before placing the tooth in the alveolus would wash out the latter with the same solution. It is easy to conceive how such a treatment might disturb the vitality of a delicate organ such as the dental pulp.

Necroplantation: One Case. After extracting a tooth, in the empty alveolus thus secured a thoroughly desiccated tooth was inserted. This root was filed to fit the socket accurately, and so tightly that once inserted it remained immovable. At the end of the fourth week consolidation had been thoroughly completed. The attachment of the root to the alveolus was exclusively osseous. Throughout the contour of the root medullary cells in an active stage of osteogenesis could be seen. Bands of newly formed bone tissue were found running from the alveolus to the periphery of the root. The union took place principally between the cementum and the osseous tissues of the alveolus, although in those grooves in which the file had reached the dentin, union between the latter tissue and the bone of the alveolus had also taken place. A point to be especially recorded in this connection was the complete absence of eliminative reaction on the part of the alveolar tissues. At the histological post-mortem examination the root presented the same appearance as before the implantation, and only at some points could be found indistinct marks of osteoclastic activity. On the other hand, perfectly well-formed osseous bands and additional ones in the formative stage could be easily discerned between the root and the alveolar walls. The union between the root and the alveolus was absolutely complete. It is interesting to add that an accidental splitting of the root which occurred during the implantation had also become thoroughly united by new bone tissue during the consolidation process.

The conclusions which the authors offer as the result of their studies and investigations are as follows:

(1) The mechanism of consolidation in bioplantation differs markedly from that in necroplantation.

(2) The alveolo-dental membrane possesses regenerative power.

(3) The life of the pulp is not necessarily destroyed by bioplantation; necrosis of the organ is, however, the most frequent operative sequence.

(4) The success of implantation depends to a considerable extent on a close adaptation and complete immovableness of the tooth.

[*Semaine Médicale*, Paris, January 17, 1906.]

A CASE OF DEATH FOLLOWING THE EXTRACTION OF A TOOTH UNDER COCAIN AND ADRENALIN ANESTHESIA.

By Dr. Maragliano, Privat Docent at the Faculty of Medicine of Genoa, Italy.

The author reports the case of a man from whom a tooth was extracted owing to a severe attack of alveolo-dental periostitis. In order to render the operation painless the gum was injected with a ½ per cent. solution of cocain containing about gm. 0.0001 (gr. 1/600) of adrenalin. The operation was easily and speedily carried out, but on the following day there was intense fever, and in addition the gingival tissue presented the appearance of having become the seat of an active necrotic process. Symptoms of intense purulent infection soon appeared, and culminated in the death of the patient, which occurred eight days after the intervention.

Although the extraction of a tooth during or shortly after an acute attack of pericemental infection is *per se* ample cause to account for a fatal termination, Dr. Maragliano opines that the accident might have been averted had the extraction been performed without the therapeutic assistance of the cocain-adrenalin solution. To the reviewer such a view of the case seems hardly plausible. The nucleus of infection was present before the injection was performed, which at the utmost could only have intensified the inflammatory process by the depressing action of the agents employed—cocain and adrenalin—upon the cellular elements of the alveolar and adjacent areas. Fatal cases traceable to pericemental infections are not so rare as the author seems to imply, and many just such cases as the one here reported can be found recorded in medical and dental literature. The severity of the symptoms and the fact that death did not occur until a week after the extraction point strongly to septicemia of dental origin as the paramount cause of the fatal termination.

PERISCOPE.

Beta-Eucain Lactate.—Beta-eucain is water-soluble to 3½ per cent.; beta-eucain lactate is water-soluble to 22 per cent., and has all the properties of the hydrochlorid.—*St. Louis Med. Review.*

Relief of Fetid Mouth.—

℞—Saccharin,	
Sodium bicarbonate, āā	gr. xv;
Salicylic acid,	gr. xxx;
Alcohol,	℥iijss.

Sig.—A few drops in a glass of water to be used as a gargle.—*American Medicine.*

Bending the Arch.—The expansion arch often produces an excessive outward movement of the molars, due to too much spring upon them, and too little space between the bicuspids and the arch. Expand the anterior portion of the dental arch first, ligating the bicuspids (and canines if necessary) very tightly to the arch, and making little effort to expand in the molar region until toward the last of the operation. The fact that the expansion arch sometimes displaces the molars is due largely to failure to observe the foregoing details.—*Western Dental Journal.*

Backing for Facings.—A very satisfactory backing for facings is obtained by using 1/1000 platinum, doubled and burnished to the facing. Its advantages are: Adaptability to the facing, less likelihood of burning the backing while soldering, and reflection of color through facing.—Henry C. Lee, *Dental Review.*

Mixing Cement for Regulating Bands.—The cement should be medium setting, and mixed very quickly and very smooth—points that require considerable practice to secure. An hydraulic cement is preferable, as it sets better wet than dry after it has once been put in place. Quick setting cements are the cause of many failures in cement bands.—*Western Dental Journal.*

For the Relief of Odontalgia.—The general practitioner is sometimes asked to prescribe for toothache, and will find the following application useful in such emergencies:

℞—Chloral hydrate,	gr. lxxv;
Cocain hydrochlorate,	gr. xv;
Camphor,	gr. lxxv;
Alcohol,	♏x. M.

Sig.—Apply to the cavity a tampon of cotton with a few drops of the solution.

—*Exchange.*

Removing Bands.—Cemented bands may be easily and quickly removed from teeth with a thin screwdriver-shaped instrument made from an old excavator or similar instrument. Insert the blade of this underneath the band, then partially rotate first one way and then the other, and start the band to tear in two. Follow up this break, turning the instrument to right and left, and the band is quickly torn entirely across. This is much easier for the patient as well as better for the tooth than to cut it in two with chisel, fissure bur, or carborundum wheel.—*Western Dental Journal.*

How to Improve Your Crown and Bridge Articulator.—The ordinary crown and bridge articulators now or the market have but one movement, namely, vertical. By the use of the mechanical saw and a few minutes of your spare time, enlarge the hole for the pin backward say one-quarter of an inch, making a slit for the pin to slide back and forth. Do the same on both sides, but only in the one piece (lower), and fasten a small rubber band to each end of the pin, allowing it to pass around in front. The elastic band will keep the articulator in a given position when at rest, but can be easily moved to give any desired position, for vertical, lateral, and antero-posterior movements, which correspond to the movements of the jaws. This simple method will save the trouble and time of making the plaster articulator and is much better.—A. F. Donahower, *Dental Brief.*

Replantation of a Misplaced Tooth.—There is one implantation operation, which is the rarest of all—the removal of a misplaced tooth and planting of the same in proper position. I once did this myself. A canine erupted entirely within the arch, apparently too far from line to be bodily moved to place. Nevertheless the space for its accommodation was present. I extracted the canine, and within half an hour had it replanted in a newly made socket in proper alignment. The new socket included no part of the old.—Rodrigues Ottolengui, *Items of Interest.*

To Keep a Hypodermic Syringe in Good Order and the Needle from Corroding.—There are several methods, but the one I believe to be the most efficacious is as follows: Pour a solution of 90 parts glycerin and 10 parts carbolic acid in a three or four ounce wide-necked bottle. Place just sufficient of the solution in the bottle to cover the whole of the needle when the two flanges of the syringe are resting over the top of the bottle, and the barrel of the syringe suspended in the center of the bottle. This preparation prevents the needle from rusting or corroding, keeps the leather of the plunger moist and air-tight, and acts as a good antiseptic.—M., *Federal Dental Journal.*

Pulp-Extirpation.—Assuming that the pathological condition of a pulp necessitates extirpation, a method which gives excellent results is this: Expose the pulp sufficiently with a razor-edged excavator to allow direct application. Then saturate a small pellet of bibulous paper with acid. carbol. liq. sufficiently to take up a minute quantity of the following powder, intimately mixed:

℞—Acid arseniosum,
Cocain hydrochlor.,
Pulv. carbo. animalis, partes æquales.

Apply lightly and seal with temporary stopping, or, if the cavity presents difficult retention, with zinc oxyphosphate cement. After five hours extract pulp with a Donaldson broach, syringe canal thoroughly with two or three quick jets of hot water in order to arrest resultant hemorrhage, and you will have a safer, cleaner, and more perfect result than the most deftly executed pressure anesthesia can give.

The writer does not recommend this method in cases of hypertrophied pulp. The experienced pathologist will know that arsenous oxid in any form is contra-indicated in this particular condition, and that any method of extirpation applied indiscriminately, without a due recognition of existing pathological conditions, will prove abortive.—STEPHEN SHERRY, *Commonwealth Dental Review.*

Cracking of Teeth in Soldering.—Personally, it is years since I had such an accident happen, and I attribute my immunity from this to the following points: (1) The use of only the best makes of teeth. (2) No riveting when backing. (3) Care in applying borax round the pins. (4) Care in slowly heating up, preparatory to soldering. (5) Soldering in one operation, so that there are no sudden changes of temperature. (6) Cooling down naturally.—W. M., *Quarterly Circular.*

General Rules in Poisoning.—There are two or three general rules that can be well remembered, and that always apply in the first treatment of cases of poisoning if the poison was taken by the mouth.

(1) A glance at the patient's mouth will at once determine whether a corrosive or non-corrosive poison was used—in case positive information on this point is not afforded otherwise. And this will at once indicate whether an emetic should be resorted to. If a corrosive poison has been swallowed, it is better to at once administer warm oil. If a non-corrosive substance has been used, however, emetics (hot mustard-water) are called for, or the stomach tube.

(2) After this first general action it may be wise, and even necessary, to inquire more thoroughly into the question of the kind of poison that is producing the effect under observation, with the view of at once employing specific antidotes.

(3) The next requirement is to sustain the natural process of life by all the reasonable and quickly responsive means at hand.

These three general principles will apply to quite every case of the kind, and may be briefly recapitulated thus: *First:* Emetics or oil, according to whether or not the mouth is burnt. *Second:* Special antidotes, if possible and needful. *Third:* Support the patient.—*Clinic Review.*

Heating up and Soldering.—When the investment is thoroughly set and trimmed, I place it under a plate heater with a moderately low flame, and when fairly warm, remove it to apply flux, solder, and scrap metal to any parts that may require building up. Then I carry it back to the heater again, gradually turn on the gas, and heat up the whole to a dull redness. When it is removed to the soldering block, I give it a general heating up with the full flame of the blowpipe, and when the whole is so hot as nearly to melt the solder I use the small flame locally, and the solder flows wherever the flame travels. If the solder has been placed in the correct position and in sufficient quantity, it is rarely necessary to add solder and melt again. I only use sufficient solder to make a thorough union of the parts, unless it be necessary to build up, when I use scrap with only sufficient solder to level up. One can save considerable time in finishing by using just the correct amount of solder, and leaving it perfectly smooth and even from the flame. Sometimes it may be necessary to use a soldering point to coax the solder into a hollow which is difficult to reach with the flame; the one I use for this purpose is a short piece of platinum wire filed to a point, soldered to a longer piece of German silver wire, which is fixed in a wooden handle. This answers perfectly, and is far superior to an iron point.—W. M., *Quarterly Circular.*

Filling of Root-Canals.—Instead of using chloro-percha as a material to fill the canal, before the use of the solid gutta-percha cone, I have been in the habit of employing a material suggested by Dr. R. L. Cochrane. It is prepared in this way, and it has proved, in my hands, one of the best materials to use in a canal before the insertion of the solid gutta-percha cone: Take one-half ounce in weight of pink base-plate gutta-percha; a half-ounce of a saturated solution of thymol in oil of eucalyptus; dissolve the gutta-percha in chloroform, add the thymol solution and mix them thoroughly; then allow the chloroform to evaporate. This results in a paste-like preparation that one can pick up with the broach and carry into the pulp-chamber. When in the chamber, heat slightly a root-filler and touch it to the solution, when the heat will soften it and cause it to flow down the finest possible canal. There is no material that I have ever used that seems so perfectly to fill small tortuous canals as this solution, which can be followed with a solid gutta-percha cone. With it I have had less soreness following root-canal treatment, more comfort generally, and afterward almost no trouble in the most stubborn cases.—B. Jones, *Texas Dental Journal.*

Tempering Gold.—Z. F. Vaughn of Los Angeles, Cal., is reported as having discovered a process of tempering gold and other metals. By his method of tempering, it is claimed that the ductile metals are not only hardened, but their density and homogeneity are brought to such practical perfection that a cutting edge is given keener and more durable than that of steel, because of the microscopic fineness and smoothness imparted to it. The inventor's experiments were devoted chiefly to the manufacture of surgical instruments of gold, his first production being a hypodermic needle of solid tempered gold. He has added to this all the instruments now in use in modern surgery. Prominent surgeons have given these instruments practical tests, and in every case the results, it is said, were entirely satisfactory. For surgical purposes, the inventor claims that instruments of tempered gold are superior to those of steel, because of their non-corrosiveness and the ease with which they may be sterilized. The secret of the process appears to be in the solution used in tempering. Under a microscope, a razor manufactured by Mr. Vaughn showed a much smoother edge than a steel razor, and a test proved that it held its edge longer.—*Stomatologist* (Editorial).

Necessity for Sterilizing the Mouth-Mirror.—The mouth-mirror is too often carried from mouth to mouth with no effort to cleanse it, to say nothing of sterilizing. To show how important it is that even so innocent an instrument as the mirror should be carefully cleansed, I will relate an incident which occurred in my practice. Very recently a young man presented himself to me for treatment, saying that he had had a tooth extracted the day before and that the socket was paining him badly. I examined the alveolus, found evidences of inflammation and made a palliative treatment; thereafter he called my attention to an inflammation of the gums about the lower third molar. I placed my glass under the tongue for an instant to moisten it and discovered a syphilitic ulcer upon the gingivæ under the tongue. I immediately withdrew my glass and made a diagnosis of syphilis. He admitted it and I proceeded with my treatment. But if I had not recognized the condition, and if I had not been in the habit of sterilizing my mirror, the beautiful girl that took my chair immediately after he departed would have been in grave danger of infection. Unfortunately we do not always recognize these cases, and worse still, the victims seldom if ever tell of their condition, so that the only safe plan is always to sterilize every instrument and appliance.—J. V. Conzett, *Dental Review.*

Fill the Permanent Teeth of Children with Gold.—The permanent teeth of children should be filled with gold if you desire them to be permanently filled. If children's molars are filled with gold when they seem to need it least, they will never need it more. The man that does not love children cannot properly fill their teeth with anything, but the man who does love children can properly fill them with anything that would be proper to fill them with. Only such men as love children should fill the teeth of children, and such children will love to have their teeth filled by such men. The men who love children can fill children's teeth with gold, and those who do not love children should not fill them at all. The man who claims that children's teeth cannot be properly filled with gold, practically admits his incapability to deal properly with children. The object of filling a tooth is to save it permanently. If the filling used would not save the tooth of an adult, there is no valid excuse for placing it in the tooth of a child. If the child had a say in the matter he would probably choose to have his tooth filled once, rather than twice or ten times. Why take advantage of his not having a say? The tooth of a child needs a filling that will save it for a longer period than in the case of an adult; then why temporize? Here's a last word especially addressed to "the busy dentist": Don't fill children's teeth at all. You have not the time.—Rodrigues Ottolengui, *Dental Review.*

Taking an Impression.—In taking a partial impression, prepare the wax as follows: To one pound of beeswax add one ounce of resin; melt the two together, run them out into a cake one-quarter inch thick; use this for the impression, as beeswax without the resin is not tenacious enough. When ready to take the impression, warm the wax and place in a flat-bottom impression cup of the proper size for the case in hand, place it in the mouth and push it gently and firmly to place; let it remain about two minutes, or throw a stream of cold water from a syringe so as to cool the wax impression; remove the impression, cut away the wax from the impression about one-eighth of an inch on all parts where the plate is to bear on the mucous membrane, then roughen the surface by running a knife into the surface of the wax horizontally, so that the plaster may hold tightly to the wax. Heat the cup so as to melt the wax slightly in order that it shall not become separated from the cup when removing the plaster impression from the mouth. Mix about two spoonfuls of plaster moderately thin, pour it into the wax impression—not into the depression made by the teeth but only on such portions of the wax impression as are to be made of plaster, so as to get the best possible adaptability; insert the cup in the mouth, having the teeth for a guide, and just as before let it remain until the plaster in the bowl breaks with a sharp fracture; then remove it and you will find the finest impression you ever saw. In case of breakage the plaster is readily placed back in position. Varnish the impression with clean sandarac varnish until glazed, and allow it to dry for four or five minutes. Mix plaster moderately thick and until the air-bubbles are well out, dip the impression in water, and throw the water off so the plaster may run accurately into the impression of each tooth; when the plaster is sufficiently hard drop it into hot water for about one minute, or until the wax begins to soften; then separate cast from impression by pulling out the wax, insert the point of a knife-blade between impression and cast at the back, and separate them. The cast will have a clean-cut, smooth, marble-like appearance, with all the teeth nicely shown, and in condition to set the artificial teeth. It is always good practice, however, to place the base-plate with the teeth attached in the mouth; should there be any change desired it is at this stage easily done. There are many patients who desire, on account of cost and for other reasons, partial plates; indeed a well-fitting partial plate is preferable many times to an ill-fitting bridge or a bridge anchored to decayed or loose teeth. A partial plate well made will give excellent satisfaction. Should there remain any stumps in the mouth, they should always be removed before taking an impression. Where there are three or four scattered teeth, unless in exceptionally good condition, I should extract them and make a full upper plate, as I deem it bad practice to depend on the pressure of a partial plate on the remaining teeth for the purpose of support. In rare cases, a clasp might be advisable in the upper partial plate.—D. J. McMillen, *Western Dental Journal.*

HINTS, QUERIES, AND COMMENTS.

MATRIX FOR POURING A MODEL.

Take a strip of tape two inches wide and about eleven inches long, dip it in melted wax until saturated, and then allow it to cool. This makes a good matrix rim when pouring plaster into an impression. When slightly warmed the waxed tape conforms to the tray and does not stick to the plaster.

G. E. Truitt.

Guadalajara, Mexico.

REMOVING BROKEN PINS FROM ROOTS.

To the Editor of the Dental Cosmos:

Sir,—The Periscope department of the Cosmos in the issue for May last quotes an article by Thos. J. McGernon on the subject of removing broken crown pins from roots, in which he advocates the use of a trephine for the purpose. With all due respect to Dr. McGernon, I think I use a method that for speed of removal and safety to the root far excels the use of a trephine. My method may not be new, but I will submit it to the judgment of your readers as to its utility.

First remove as much of the cement around the pin as possible with a small bur, being careful not to go too deep, as the bur might bind and break, or one might cut through the side of the root. Then take an inverted cone bur (No. 40 to 42 S. S. W.) to the lathe wheel and grind it down until you have a long, sharp three-sided spear-pointed drill. With this follow down the side of the pin, cutting out the cement. Alternate your drilling with gently trying the pin with a small pair of pliers, and you will be surprised at the ease and rapidity with which broken pins can be removed.

C. H. Van Deventer, D.D.S.

Herington, Kans.

OBITUARY.

DR. OSCAR N. HEISE.

Died, on Tuesday, May 15, 1906, at his home in Cincinnati, Oscar Noble Heise, D.D.S., in his forty-seventh year, death being due to an abdominal tumor.

Oscar Noble Heise was born October 18, 1860, in Ohio, at New Bremen. His father, Rev. Carl Heise, who was a native of Halle, Germany, and was a scholarly divine of the Lutheran Church, had been educated at the University of Halle, and after leaving his alma mater had spent some time as a tutor in high families in the neighborhood. Having a predilection for the ministry, he gave himself to the study of theology, and was afterward appointed to the Lutheran Church at Halle, and had been preaching there for five years, when he left Germany for America in order to minister to his fellow-countrymen in this land. After his incumbency at New Bremen, he occupied the pulpit of the German Lutheran Church in Cincinnati for twenty-five years. Specially qualified as he was to do so, he personally undertook the preliminary education of his children, and thus it was that young Oscar did not enter the public schools at New Bremen until the age of twelve years. After graduating from the public schools, he attended for several years the Ohio Mechanics' Institute.

When about seventeen years of age Oscar N. Heise, while on a visit to Cincinnati, made up his mind to become a dentist, and he immediately entered upon his training for the profession by placing himself under the preceptorship of Dr. E. G. Betty of that city—with which his own name was subsequently to be so honorably associated. He afterward studied in the Ohio College of Dental Surgery, from which institution he was graduated in 1879. Those who had the pleasure of his acquaintance in those early days discerned in him excellent qualities that indicated a career of more than common interest. On his graduation he established himself in practice in Cincinnati, and before long found himself well appreciated by a considerable *clientèle* of desirable character.

His enthusiasm as a scientific student was not satisfied, however; he now aimed at the addition of the medical degree. Taking all the time he could spare, he worked toward this goal, and in 1886 was graduated from the Ohio Medical College. A few years later, having determined to qualify as a specialist in nose and throat diseases, he took a course of some months in New York with this object in view, and also spent the summer of 1893 in Europe in the same pursuit. He became well qualified in this specialty, which he added to his dental practice. However, dentistry, his first love, was ever the dearest to his heart.

He was an able member as well as an assiduous attendant of various dental professional organizations. In the Ohio State Dental Society he had been called to hold various official positions, which he sustained with much credit. He was constantly on hand at the meetings of the National Dental Association. He was also much interested in the labors of the section on Stomatology of the American Medical Association, of which he was a member, and held strongly to the claim that dentistry must be recognized as a true specialty of medicine. For several years he was a member of the Ohio State Board of Dental Examiners.

Scholarly in character as he was by inheritance and by habit, he exhibited the modesty which often accompanies such a nature. With all his equipment, he was not prolific as a writer or speaker; but when he did express himself his message compelled attention from its inherent value.

One of its organizers, he was a continuously kindly and capable worker in the interests of the Cincinnati Odontological Society, whose members, as well as those of other organizations with which he was connected, will deeply feel, together with his family connections and the large circle of his patients and friends, the withdrawal from the earthly scene, all too soon, of one so marked by capacity, kindness, and faithfulness.

He leaves a widow and one daughter to mourn their irreparable loss. Mrs. Heise was formerly Miss Amelia L. Marqua, and was married to Dr. Heise in 1884.

SOCIETY NOTES AND ANNOUNCEMENTS.

NORTH NEBRASKA DENTAL ASSOCIATION.

THE third semi-annual meeting of the North Nebraska Dental Association will be held at Norfolk, Neb., October 4, 1906.

C. S. PARKER, *Sec'y*,
Norfolk, Neb.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE ninth annual session of the Southern California Dental Association will be held in Santa Barbara, Cal., October 8, 9, and 10, 1906.

CHAS. M. BENBROOK, *Sec'y*,
455 S. Broadway, Los Angeles, Cal.

NORTHERN ILLINOIS DENTAL SOCIETY.

THE Northern Illinois Dental Society will hold its nineteenth annual meeting at Aurora, Ill., October 17 and 18, 1906. All dentists of the district are urged to attend; a good program is assured.

A. M. HARRISON, *Sec'y*,
Rockford, Ill.

SEVENTH AND EIGHTH DISTRICT (N. Y.) SOCIETIES.

A UNION meeting of the Seventh and Eighth District Dental Societies of the State of New York will be held in the Dental Department of the University of Buffalo, 25 Goodrich st., Buffalo, N. Y., October 30 and 31, 1906.

NORTHEASTERN DENTAL ASSOCIATION.

THE twelfth annual meeting of the Northeastern Dental Association will be held in Horticultural Hall, Boston, Mass., October 17, 18, and 19, 1906.

This meeting—held in Boston—can and will be made a great success. The talent for both essays and clinics is of a very high order, and plenty of it. The exhibits also promise to be elaborate and interesting. Please remember the dates. An invitation is extended to all ethical members of the profession to attend.

EDGAR O. KINSMAN, *Sec'y*,
Cambridge, Mass.

FIFTH DISTRICT (N. Y.) DENTAL SOCIETY.

THE thirty-eighth semi-annual meeting of the Fifth District Dental Society of the State of New York will be held in Utica, N. Y., November 13 and 14, 1906.

C. A. SAYERS, *Sec'y*,
Watertown, N. Y.

SIXTH DISTRICT (N. Y.) DENTAL SOCIETY.

THE thirty-eighth semi-annual meeting of the Sixth District Dental Society of the State of New York will be held at Cazenovia, N. Y., Friday and Saturday, October 5 and 6, 1906. An interesting program will be provided, and a dinner will be served in honor of Dr. A. M. Holmes of Morrisville.

FRED FORD, *Sec'y*,
Cazenovia, N. Y.

G. V. BLACK DENTAL CLUB OF ST. PAUL.

THE members and friends of the G. V. Black Dental Club of St. Paul (Inc.) will hold their annual midwinter clinic in February 1907.

Last year we held the largest, best, and most enthusiastic meeting ever held in the Northwest.

The program is now being arranged by the

Clinic Committee. The operative clinic will be of its usual high order. There will be a number of progressive clinics on both days of the meeting. Several of the best known men in the dental profession will read essays. The table clinics will be the most interesting and instructive which we are able to obtain. The program and dates on which the meeting will be held will shortly be published.

Members of the dental profession in the United States and Canada cordially invited to attend our clinic.

Special rates on all railroads. For any further information apply to

R. B. Wilson, *Sec'y*,
107 E. Sixth st., St. Paul, Minnesota.

SOUTHERN NEBRASKA DENTAL SOCIETY.

At the first meeting of the Southern Nebraska Dental Society, held in Red Cloud, Neb., August 30, 1906, the following officers were elected: Frank Nelson, Superior, president; J. M. Prime, Oxford, vice-president; W. A. McHenry, Nelson, secretary and treasurer.

The next meeting will be held in Superior, Neb., November 14, 1906.

W. A. McHenry, *Sec'y*.

CENTRAL NEBRASKA DENTAL SOCIETY.

The Central Nebraska Dental Society was organized March 16, 1906, with the following officers: W. V. Sharp, Stromsburg, president; Geo. Gallagher, Utica, vice-president; Homer Hatfield, York, secretary and treasurer. Chairman of Program Committee—A. M. Bell, Osceola.

The best of feelings prevailed, with a good attendance. The next meeting will be held in Seward, Neb., October 16 and 17, 1906. All ethical dentists are cordially invited.

W. V. Sharp, *President*,
Stromsburg, Neb.

NEW JERSEY STATE DENTAL SOCIETY.

At the annual meeting of the New Jersey State Dental Society, held at Asbury Park, N. J., July 18, 1906, the following officers were elected: M. R. Brinkman, Hackensack, president; Walter Woolsey, Elizabeth, vice-president; Chas. A. Meeker, Newark, secretary; Herbert S. Sutphen, Newark, assistant secretary; Henry A. Hull, New Brunswick, treasurer. Executive Committee—Walter Woolsey, Elizabeth; W. A. Jaquette, Salem; Harvey Iredell, New Brunswick; Frank G. Gregory, Newark; C. H. Dilts, Trenton. Membership Committee—Wallace F. Naylor, Somerville; B. L. Rhome, Asbury Park; C. P. Tuttle, Camden; G. L. D. Tompkins, Asbury Park; F. K. Heazelton, Trenton.

Chas. A. Meeker, *Sec'y*.

MICHIGAN BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Michigan Board of Examiners in Dentistry will be held at the Detroit College of Medicine, Detroit, Mich., October 24 to 27, 1906, for the examination of all applicants to practice in Michigan.

A. L. LeGro, *Sec'y*,
Three Rivers, Mich.

MARYLAND BOARD OF DENTAL EXAMINERS.

The Maryland State Board of Dental Examiners will meet for examination of candidates for certificates November 7 and 8, 1906, at the Dental Department of the University of Maryland, Baltimore, at 9 A.M. For application blanks and all information address

F. F. Drew, *Sec'y*.
701 N. Howard st., Baltimore, Md.

ILLINOIS BOARD OF DENTAL EXAMINERS.

The regular annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held in Chicago, at the Chicago College of Dental Surgery, cor. Wood and Harrison sts., commencing Monday, November 12, 1906.

Persons in possession of the following requirements will be eligible to take the examination: First, all persons who have been engaged in the actual, legal, and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (Second), is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university; or (Third) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary upon application to the secretary. All applications must be filed with the secretary five days prior to the date of examination, and the diploma must be presented at the time of matriculation.

Address all communications to

J. G. Reid, *Sec'y*,
1204 Trude bldg., Chicago, Ill.

OKLAHOMA BOARD OF DENTAL EXAMINERS.

There will be a meeting of the Oklahoma Board of Dental Examiners held at Oklahoma City on November 6, 7, and 8, 1906, for the purpose of examining candidates for license. For necessary blanks and information address

A. C. Hixon, *Sec'y*,
Guthrie, Okla.

RHODE ISLAND BOARD OF REGISTRATION.

The semi-annual meeting of the Rhode Island State Board of Registration in Dentistry, for the examination of candidates, will be held at the State-house, Providence, November 6, 7, and 8, 1906. Applications, together with the fee of twenty dollars, if first examination, should be in the hands of the secretary not later than November 1st.

W. S. Kenyon, *Sec'y*,
301 Westminster st., Providence, R. I.

OHIO BOARD OF DENTAL EXAMINERS.

The regular semi-annual meeting of the Ohio Board of Dental Examiners will be held in Columbus, commencing November 27, 1906. Only graduates are eligible to examination. Application, accompanied by fee of $20.00, should be filed with the secretary by November 17th. For further information address

H. C. Brown, *Sec'y*,
185 E State st., Columbus, Ohio.

IDAHO BOARD OF DENTAL EXAMINERS.

The Idaho Board of Dental Examiners meets in Boisé City, December 27, 28, and 29, 1906, for the purpose of examining applicants for license to practice dentistry in Idaho.

C. E. M. Loux, *Sec'y*,
Pocatello, Idaho.

NEW HAMPSHIRE BOARD OF REGISTRATION.

The semi-annual meeting of the New Hampshire Board of Registration in Dentistry for the examination of candidates will be held at Masonic Banquet Hall, Manchester, N. H., December 11, 12, and 13, 1906.

A. J. Sawyer, *Sec'y*,
Manchester, N. H.

NEW JERSEY BOARD OF REGISTRATION.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual meeting in the State-house, at Trenton, N. J., beginning Monday, December 10, 1906, at 9 a.m., and continuing through the 11th, 12th, and 13th. Practical and theoretical work completed at this place.

All applications must be in the hands of the secretary ten days prior to the meeting.

For further information apply to

Charles A. Meeker, *Sec'y*,
29 Fulton st., Newark, N. J.

CONNECTICUT DENTAL COMMISSIONERS.

The Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Wednesday, Thursday, and Friday, November 7, 8, and 9, 1906, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before said meeting.

All applicants should apply to the recorder for proper blanks and the rules for conducting the examination. Application blanks must be filled in and sworn to, and, with fee, filed with the recorder on or before November 1, 1906. By order of the Commission.

Gilbert M. Griswold, *Recorder*,
783 Main st., Hartford, Conn.

IOWA BOARD OF DENTAL EXAMINERS.

THE Iowa State Board of Dental Examiners will hold its next meeting at Iowa City, beginning at 9 A.M., Tuesday, December 4, 1906.

Written examination in all the regular college branches, also practical work in operative dentistry. Engines will be furnished, but instruments and materials must be furnished by the applicant. Applications must be in the hands of the secretary at least five days prior to above date.

For further information and application blanks address

E. D. BROWER, *Sec'y,*
Le Mars, Iowa.

MASSACHUSETTS BOARD OF REGISTRATION.

A MEETING of the Massachusetts Board of Registration in Dentistry, for the examination of candidates, will be held in Boston, Mass., October 24, 25, and 26, 1906.

Candidates who have applied for examination will report to the secretary, Wednesday, October 24th, at 10 o'clock A.M., at Tufts College Dental Infirmary, corner Rogers and Huntington avenues, prepared with the rubber dam, gold, plastic filling materials and instruments, to demonstrate their skill in operative dentistry. Anyone who wishes may bring his patient. So far as possible patients will be furnished. The board in every instance selects the cavity to be filled. Partially prepared cavities never accepted.

The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridge work, orthodontia, anatomy, histology, surgery, pathology, materia medica, therapeutics, physiology, bacteriology, anesthesia, chemistry and metallurgy, and will be held at the Civil Service Rooms, State-house, from Thursday, October 25th, 10 A.M., until Friday P.M., October 26th.

All applications, together with the fee of twenty dollars, if first examination, must be filed with the secretary of the board on or before October 20th, as no application for this meeting will be received after that date.

Hereafter candidates for second and subsequent examination will be required to fill out an application blank (Form 2) and forward it to the secretary as above.

Every candidate for examination must be twenty-one years of age. Application blanks may be obtained from the secretary. Temporary licenses are never granted. The fee for third and subsequent examinations is five dollars.

G. E. MITCHELL, *Sec'y,*
Haverhill, Mass.

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UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING AUGUST 1906.

August 7.

No. 827,824, to FREDERICK W. STEPHAN. Dental articulator.

No. 827,910, to JOHN A. HOLLENBERGER. Apparatus for administering liquid anesthetics.

No. 827,965, to GEORGE ENGLE. Tooth-brush.

No. 828,109, to ADOLF GRUNSTEIN. Apparatus for stamping and shaping dental metal crowns.

August 14.

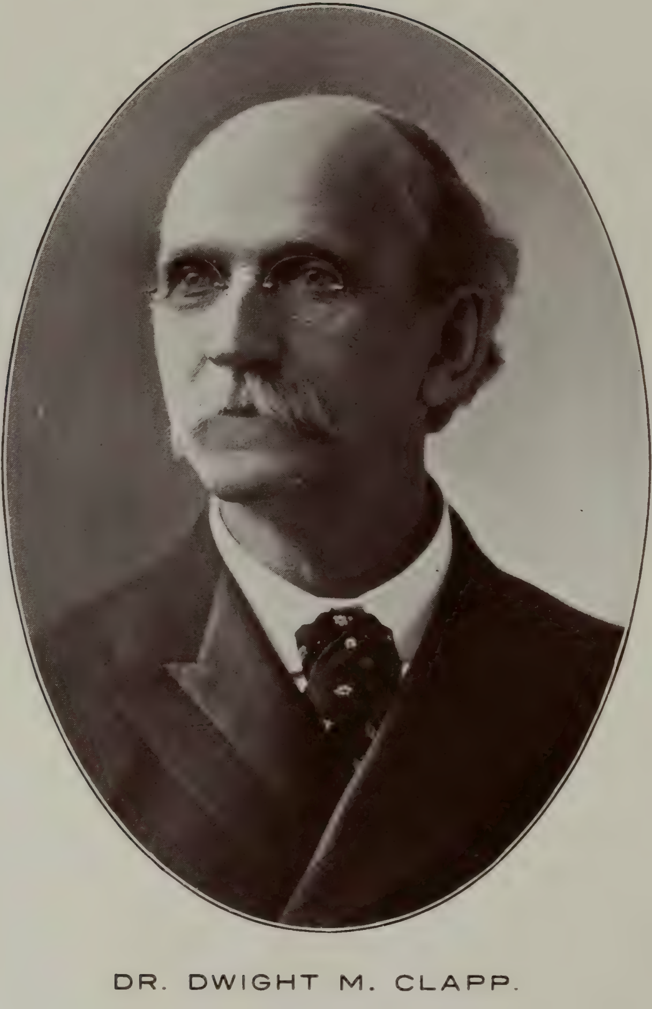
No. 828,393, to HOMER EMERSON. Mirror for brushes or the like.

August 21.

No. 829,119, to FRANK X. MELLEN. Dental plugger.

August 28.

No. 829,395, to NATHAN K. GARHART, JR. Dental engine.



DR. DWIGHT M. CLAPP.

THE

DENTAL COSMOS.

VOL. XLVIII. NOVEMBER 1906. No. 11.

ORIGINAL COMMUNICATIONS.

SOME OF THE FACTORS THAT MODIFY THE HUMAN JAWS AND OTHER PORTIONS OF THE FACE.

By **M. H. CRYER, M.D., D.D.S., Philadelphia, Pa.,**
PROFESSOR OF ORAL SURGERY, UNIVERSITY OF PENNSYLVANIA.

(Read before the Massachusetts Dental Society, at its forty-second annual meeting, Boston, June 5, 1906.)

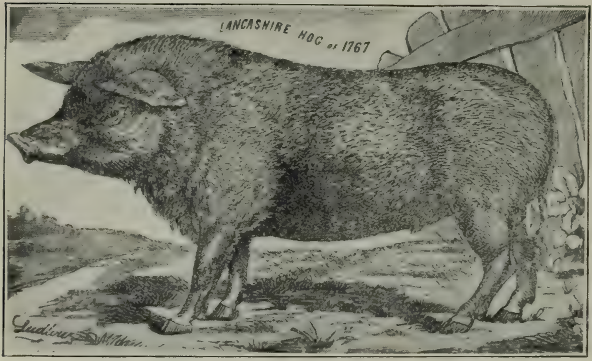
THE factors involved in the modification of the human face have existed during the entire evolutionary process concerned in the development of the *genus Homo;* indeed, their influence may be said to have been exerted from the time of the primal protoplasms. To study all these conditions would be extremely interesting to those who have the time and inclination to follow the wonderful modification that have been brought about by evolution.

In the breeding of animals we have the axiom, "Like begets like." This is especially true when sire and dam are of the same type of the same breed. "In-breeding" has the tendency to establish the typical characteristic; in fact it is upon these principles that the various breeds of horses, dogs, pigeons, etc., acquire such marked lines of distinction. The scientific breeder of animals has this matter under control, while in the human race, with but few exceptions, it is under the control of a passion which proceeds with entire disregard to the character or quality of the product.

The true study of the morphology of the human race cannot be carried on without a knowledge of comparative anatomy. The limited time at our disposal will only permit the showing of a few illustrations. Those who have studied the domestic animals know the great variations in the recognized breeds. For an example in the domestic pigeon class, take as one extreme the carrier, with its long head and beak, the excrescences or wattles around the eyes and nostrils, the great length of the body and wings, and compare it with the other extreme, the almond tumbler, with its short or round head and body and the shortest of beaks; they will be found to be so different that one not familiar with the subject would place them in different classes of birds.

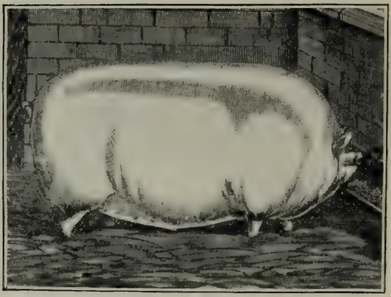
Take, again, the domestic hog, and observe the great differences in the form of the body, legs, and head, in the two illustrations, Figs. 1 and 2, demonstrating what the fancier has done in one hundred years of careful selecting and breeding.

Fig. 1.



Lancashire hog. Prize-winner, 1767.

Fig. 2.



Lancashire hog. First prize, 1867.

Fig. 1 represents the Lancashire hog of 1767, a hog with long, strong legs, which together with the form of the body would show strength and speed; his long head and face are very marked, showing great rooting power. This hog was a winner at Manchester agricultural show of 1767.

Fig. 2 is a picture of the winner of the first prize at the centennial show of the same society in 1867. The legs are very short, the body deeper, the head smaller, and the face shorter.

One of the most marked variations in shape, size, general character, and disposition in the same class of animals is that of "man's best frient," the dog. Take two illustrations which are well known, the greyhound and the bulldog. The former has been well bred for centuries, his pedigree kept with the greatest of care for the royal sport of coursing. As everything else is sacrificed in this dog to speed, quickness of turning, and great endurance, he is consequently one of the most graceful of animals. He is shown in Fig. 3. The bulldog of today is the opposite of the greyhound; he is different in nearly all of his attributes, beginning with the jaws and head, then the body and legs, and ending with the tail. A good representative bulldog is shown in Fig. 4.

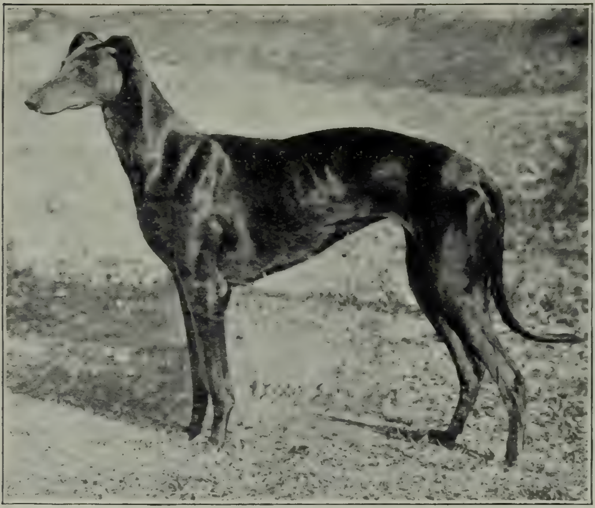
Fig. 5 is made from the skull of the greyhound, showing the long-reaching jaw which assists him in catching the game. The teeth are in good alignment and fairly good occlusion, one of the factors so essential for a clean mouth, and this dog is known especially for this attribute.

Fig. 6 is a side view of the deformed head and jaws of the bulldog, with its mal-aligned and maloccluding teeth, and its marked "forward bite." The bulldog consequently has malformed nasal chambers—contrary to that of the greyhound—a diseased mouth and foul breath, pyorrhea alveolaris, the result of all these conditions being well illustrated in the picture.

As to the human race, men are brought closer and closer together by the rapid modes of travel and intercommunication, consequently the various races of mankind are becoming more mixed each year. This racial intermixture will fail to produce in the offspring the harmony of features that exists in any unmixed race.

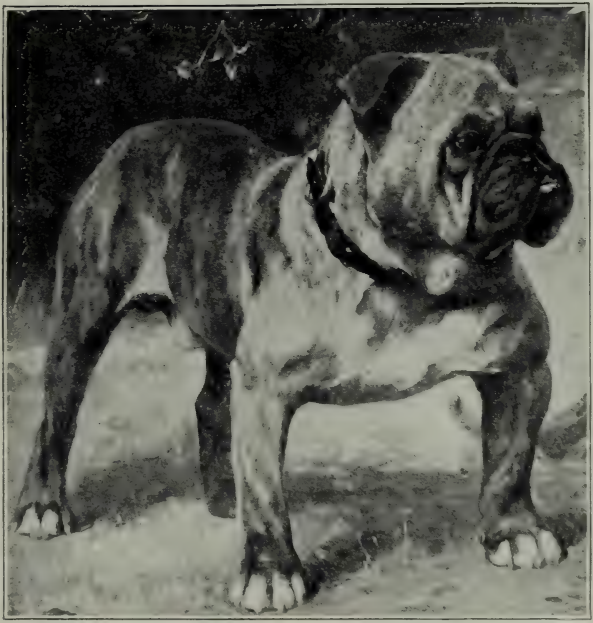
In great centers of immigration, like

FIG. 3.



Greyhound.

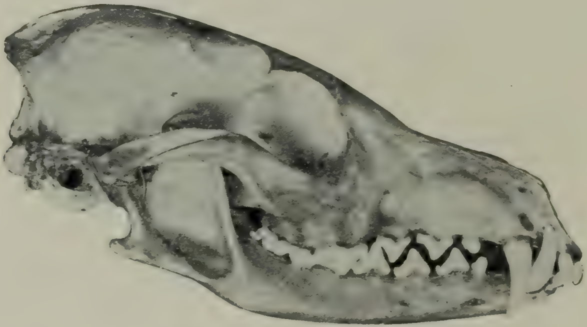
FIG. 4.



Bulldog.

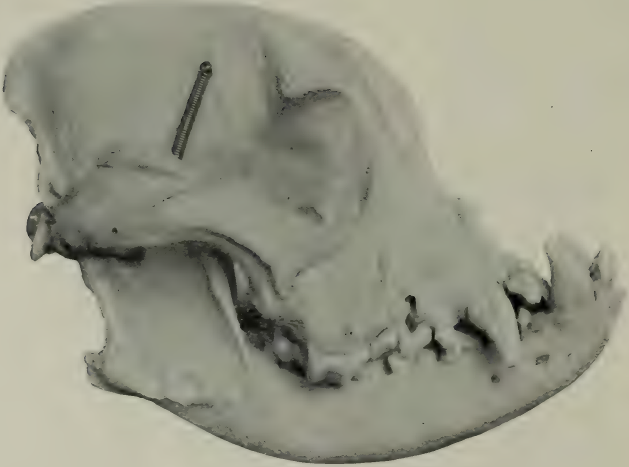
New York city, the intermarriage of German, Italian, and Hebrew races will in time produce a distinct type. At first the offspring of such unions may possess some of the characteristics of the father and some of the mother. These may not always harmonize with each other, with the result that the teeth are not in harmony with the face, or the mandible with the maxilla. This non-harmony of features is not pleasing to the esthetic person; and as a consequence, in this country of mixed races there is a growing demand in the profession for specialists who study the forms of various faces with a view to their correction. This cannot be accomplished by any dogmatic rule; it must be done on general principles based upon the knowledge of comparative anatomy of the varied types of faces of the human race, and such practitioners must also have a special and general knowledge of the pathological conditions which before and after birth produce changes such as are responsible for inharmony of the facial features.

FIG. 5.



Skull of greyhound.

FIG. 6.



Skull of bulldog.

On general principles, if a child be born of typical and otherwise healthy parents, as an almost universal rule the jaws are in typical relation with each other, and the germs of the deciduous teeth usually develop normally. When parturition is normal the development of the jaws and teeth proceeds along the same lines, in such a manner that the teeth will be found in typical alignment and occlusion, and the arches typically formed. Acute pathological systemic conditions by themselves would appear to have insufficient influence upon the deciduous teeth and the jaws at this period to cause them to assume other than regular positions. The initial impulse toward typical anatomy is strong enough under these conditions to carry these subjects through the teething period with only slight departure from the normal. Chronic disturbing pathological conditions, unless their effects be counteracted, exert an enormous influence in the way of structural alterations of the permanent teeth, in their misplacement, and in modifying the shape of the jaws and face. Some of these disturbing factors are hereditary syphilis, scarlet fever, smallpox, and the other diseases which leave an impress upon the dermoid tissue and its appendages. The anatomical features of the face, the maxillary sinus, the nasal chamber and its pneumatic sinuses, the orbits, etc., are also modified in form and structure through these influences, thus interfering with the organs of mastication, speech, breathing, olfaction, sight, and even hearing. In order to avoid these disturbing influences precaution should be taken to prevent the supervention of pathological, mechanical, or other abnormal conditions. This precaution should be observed from and during the time of birth until the eruption of all the permanent teeth.

INFLUENCE AT THE TIME OF BIRTH.

In difficult labor the child's head is often injured by the use of obstetrical forceps. In such cases the jaws may sometimes be crushed, or only slightly bruised. It may not be observable at the time, but is sufficient to cause, during the process of repair of the thus injured tissues, pathological changes which will influence the internal structures of the delicate framework of the jaws and face, and many deformities are the results of such unobserved injuries. The mandible may be drawn forward until the condyles are up on the articulating eminences. The disfigurement at this time of life is so slight that it is seldom noticed by those who have charge of the child. If the displacement of the mandible be not reduced, the temporo-mandibular articulation will be changed from the glenoid fossa into whatever position the condyles may assume. A similar condition can be brought about when the child is born by a breech presentation. The mandible is then liable to be carried forward by coming into contact with the tissues overlying an unyielding os pubes.

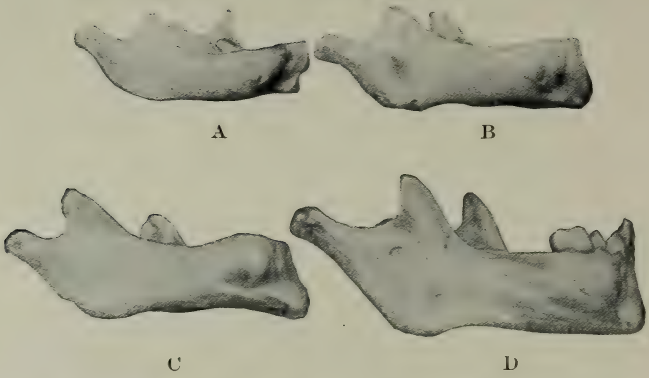
The jaws of the child should be carefully examined at the time of birth, to ascertain whether there has been any misplacement of the mandible, as well as for other injuries, and all corrections as far as possible should be made at once. In the DENTAL COSMOS for March 1906 there is an excellent paper by Dr. Langdon S. Chilcott, Bangor, Me., on "Obstetrical Deformity of the Mandible," in which attention is drawn to breech presentations. He claims that it is such presentations that cause the straightening of the mandible at the angle, thus producing a forward bite. It is possible that the angle may be damaged at the time of birth so that in the process of repair structural changes take place that prevent the formation of the normal acute angle present in adult life; for at the time of birth the jaw, as a matter of fact, is almost straight, viz, at the angle shown at A, in Fig. 7.

While many forward bites are found that would uphold Dr. Chilcott's theory that an obtuse angle of the jaw or a straightened jaw will carry the teeth forward, many more cases of forward bite are found with the mandible having acute angles, and we find correct bites even with obtuse angles.

Fig. 8 shows two jaws in which there is not much difference in the angle, but there is a marked difference in the position of the teeth. The alveolar process holding the teeth is carried well forward in A, while in B they are a little backward and might be said to be in a typical position.

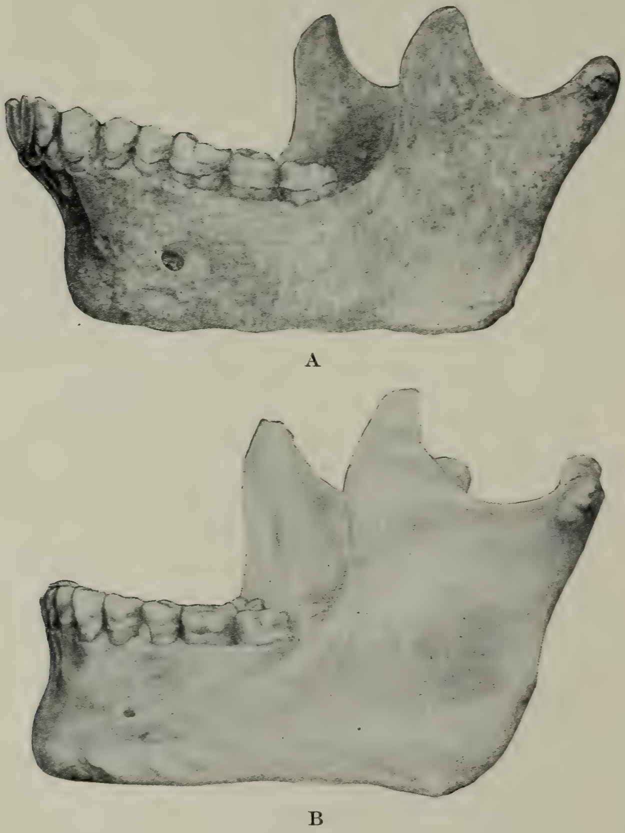
Dr. Horace H. Howe, Boston, has kindly given me three photographs of a skull that has a forward bite of the mandible.

Fig. 7.



Four mandibles, ranging from birth to eighteen months. A, at birth; B, at three months; C, at six months; D, at eighteen months.

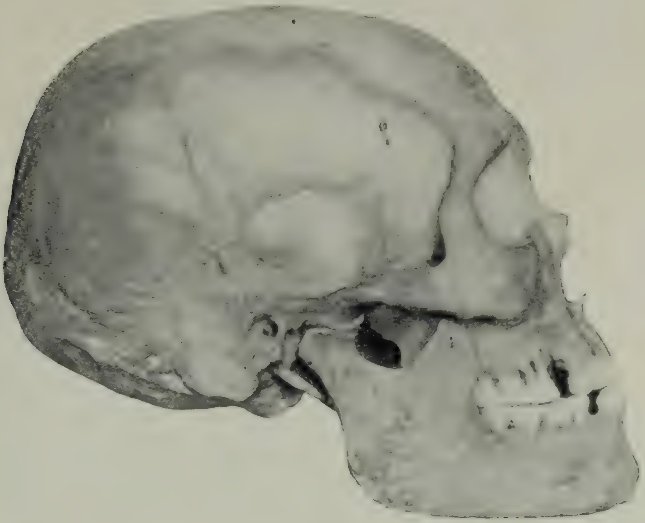
Fig. 8.



Two mandibles. A, from an adult of the Fan tribe of West Africa; B, from an adult Caucasian.

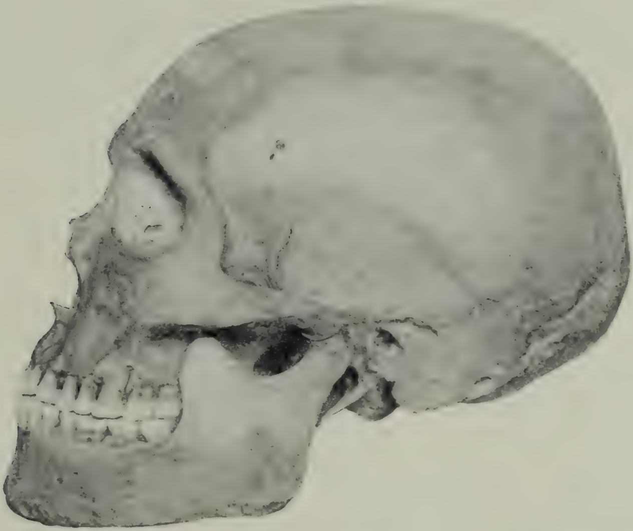
Figs. 9 and 10 are made from two of these photographs, and show that the angle is acute; they also show that the condyloid processes are forward upon the eminentiæ articulares, and that this has become the point of articulation instead of the anterior portion of the glenoid fossa. Soon after receiving these pic-

Fig. 9.



View of right side of skull showing forward bite of mandible and condyloid process resting on eminentia articularis. (From a specimen in the Peabody Museum, Cambridge, Mass.)

Fig. 10.

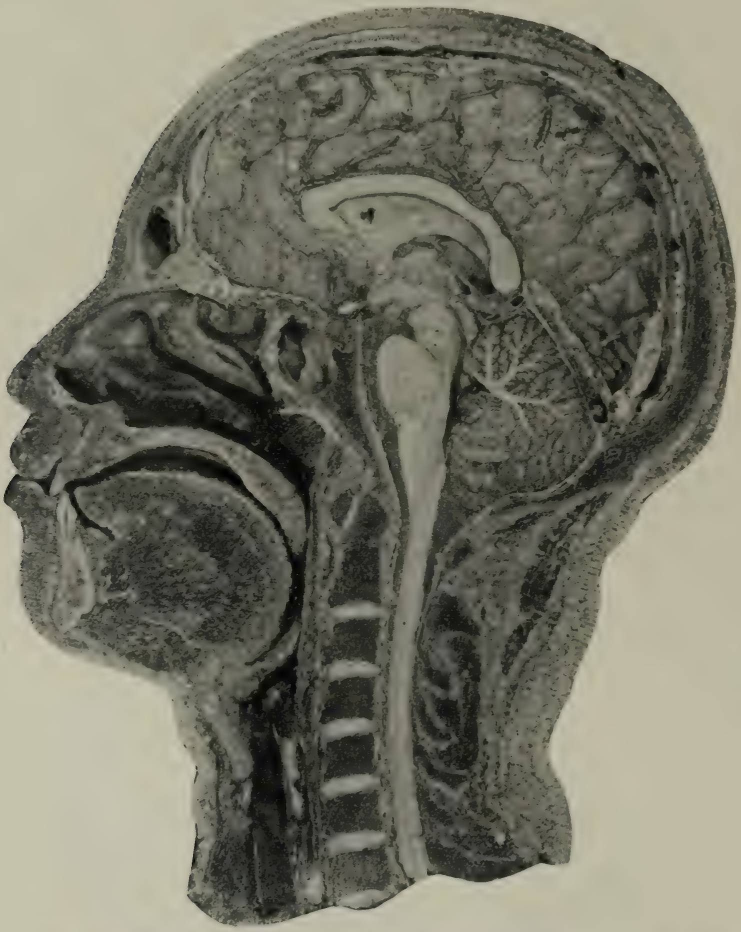


View of left side of skull showing forward bite of mandible and condyloid process resting on eminentia articularis. (Peabody Museum.)

tures I had a patient—a physician, by the way—who had a similar bite. On inquiring if he had any information regarding his birth, he said that his had been a case of breech presentation; and after an examination of the angle and the position of the condyles it was decided he had what might be considered as the normal angle for his age (thirty-five years), but the condyloid process appeared forward of the glenoid fossa when the mouth was closed, thus accounting in this case for the forward bite. To substantiate the digital examination a radiogram was taken which plainly indicated that the whole mandible was forward of the typical position.

Diseases of the deciduous teeth become an important factor in the change and modification of the shape of the internal structures of the face. In order to avoid the results of these disturbances the deciduous teeth should receive unremitting care, to the end that decay be not allowed to progress in such a manner that their pulps shall become exposed or lost

Fig. 11.



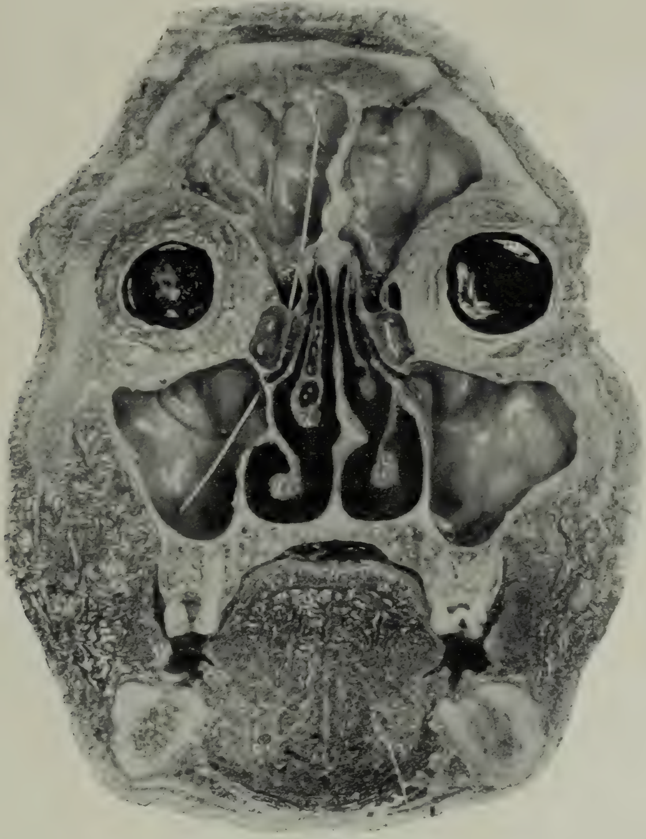
Sagittal section of head showing that the tongue fills the mouth almost completely.

before the physiological time for the teeth to be "shed." The premature loss of but one of these teeth may cause the disarrangement of all the permanent teeth, and may modify the internal anatomy of the face. Inflammatory conditions in or about the deciduous teeth may prevent a normal development of the alveolar process and of the jaw proper. For these reasons the care of the deciduous teeth and the mouth during the period of the eruption of the permanent ones should be in the hands of one who thoroughly understands the importance of preventing the loss of the deciduous teeth before the physiological time.

The tongue has been claimed to be a factor in the molding of the jaws. Of course it exerts an influence, but more than likely it is slight. If the tongue in the living subject be examined it is necessary to have the mouth opened, and through this action the tongue is displaced, so that one cannot judge what relation it has to the walls of the mouth. If the heads of two cadavers be prepared by freezing, etc., and then sectionized, one being cut sagittally and the other transversely perpendicularly, the two can be examined, and a better idea of the size, shape, and position of the tongue obtained.

Fig. 11 is made from a sagittal section. It shows that the tongue fills the mouth

FIG. 12.

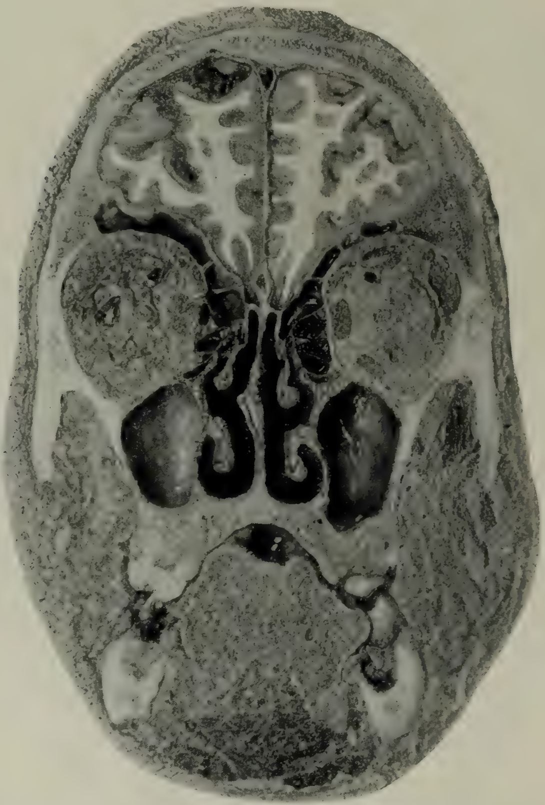


Transverse section of head showing the tongue filling the mouth laterally.

almost completely from the anterior teeth back to near the post-pharyngeal wall, except along the center of the roof of the mouth.

Fig. 12 is made from a transverse perpendicular section. It shows that the tongue fills the mouth from side to side, and when the teeth have been lost the tongue partially fills the open space, and in many cases will extend through that space, so as to come in contact with the buccal surfaces. In examining the tongue of the living the indentations made by the teeth are often shown. Under the center of the hard palate it will be noticed that the tongue does not fill the cavity at this point, the open space corresponding to that shown in the sagittal section, Fig. 11. It is claimed by some physiologists that this open space acts as a partial vacuum chamber, which when the air is exhausted, assists in helping to keep the mouth closed, somewhat on the principle of the "air-chamber" in an artificial denture. It is well to draw attention in this illustration to the direction of the mylo-hyoid muscles, extending from the mandible to the hyoid bone forming the floor of the mouth; they are nearly horizontal. When the mouth is opened the hyoid bone descends, along with its associated tissue, and these muscles assume a V-shaped position. This will be illustrated farther on; also its importance in modifying the shape of the jaws will be shown.

Fig. 13.

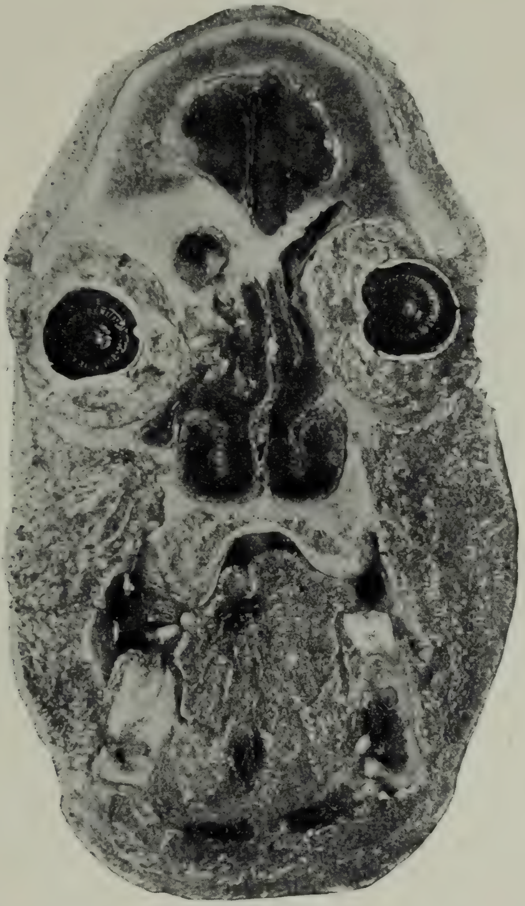


Transverse section of head illustrating the influence of the mouth on the outline of the tongue.

Fig. 13 is made from another transverse perpendicular section where the face has become narrow, the mouth compressed, and a few teeth lost. The tongue is irregular in its outline, indicating that the mouth has had more influence in modifying the tongue than the tongue in shaping the mouth.

Fig. 14 is another illustration similar to Fig. 13. The face is more compressed, there is no maxillary sinus on the right side, and only a very small one on the left. The alveolar processes of the maxilla are apparently pressed inward, forming what is designated as a high arch. If these were carried outward into a typical position the arch would not be considered high. The mandible is narrow, not only the alveolar process, but each side of the body of the jaw as well, and consequently the tongue is narrow and compressed as compared with one of typical shape as shown in Fig. 11.

Fig. 14.



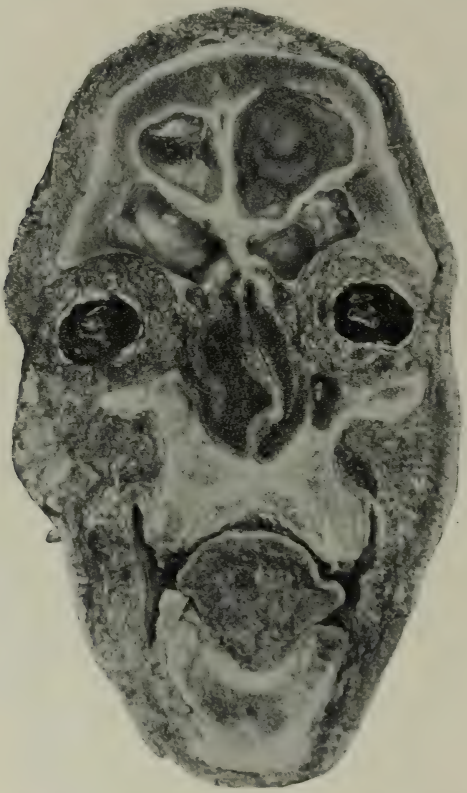
Transverse section of head showing absence of maxillary sinus on the right side and a very small one on the left.

Fig. 15 is made similar to Figs. 13 and 14. The septum of the nose is deflected, the turbinate bones undeveloped, and the wall of the maxillary sinus and the entire face is narrowed.

Fig. 16 is made from the same skull as Fig. 15, cut through the region of the rami and the naso-pharyngeal space. The latter is filled with adenoid growths until there is but little chance for nasal respiration, and I should judge this patient to have been a mouth-breather.

Mouth-breathing and sucking of the thumb or any foreign substance while the mouth is undergoing development will modify not only the shape of the mouth itself, but that of the whole face. Everything that might induce a habit of keeping the jaws apart should be carefully avoided. The jaws are molded and expanded during embryonic life, and after birth by contact with each other. When they are apart, the action of various muscles tends to draw them inward. The hyoid group has a tendency to draw the mandible in at the angles. The palato-glossus and other muscles of this region also draw the tuberosity of the maxilla inward, and the facial muscles are presumed to act in a similar manner. The sucking of the thumb or of false nipples puts into action the muscles connected with the orbicularis oris, which action, in concert with that of the palato-glossus and the palato-pharyngeal, assist in bringing about a contraction of the arches.

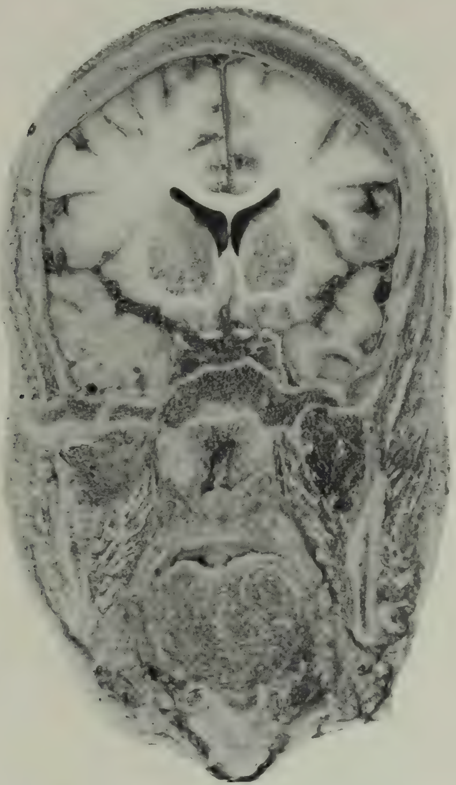
Fig. 15



Transverse section of head showing deflected nasal septum, undeveloped turbinates, and narrowed maxillary sinuses and face.

Fig. 17 is made from a transverse perpendicular section cut through the region of the rami. When the mouth is opened the hyoid bone, with the associated tissues, is drawn downward. This places upon a tension the elevating muscles of the tongue, the hyoid bone, the pharynx, and other structures that are closely associated with them. This group of muscles and those of expression, being in nearly constant action, must exercise an influence in compressing the jaws and other portions of the face, but loss of the nearly constant contact of the teeth—through the mouth being kept open—has more to do with causing deformity or malformed jaws and face than has the muscular action. Other influences similar in action to those induced by adenoid growths proceed from diseased teeth, inflamed pericementum, and alveolar abscesses. As children suffering from such conditions will hold the jaws apart, and will not fully use them in mastication, the teeth will become "elongated," and other deformities will follow in consequence. Inflamed alveolar processes, whether brought about through infection from diseased teeth or otherwise, also exert a great influence in modifying the shape of the jaws and face, as the internal structure of the bone either softens and breaks down or becomes more solidified than it should be under normal conditions, thus preventing its expansion and destroying its elasticity.

FIG. 16.

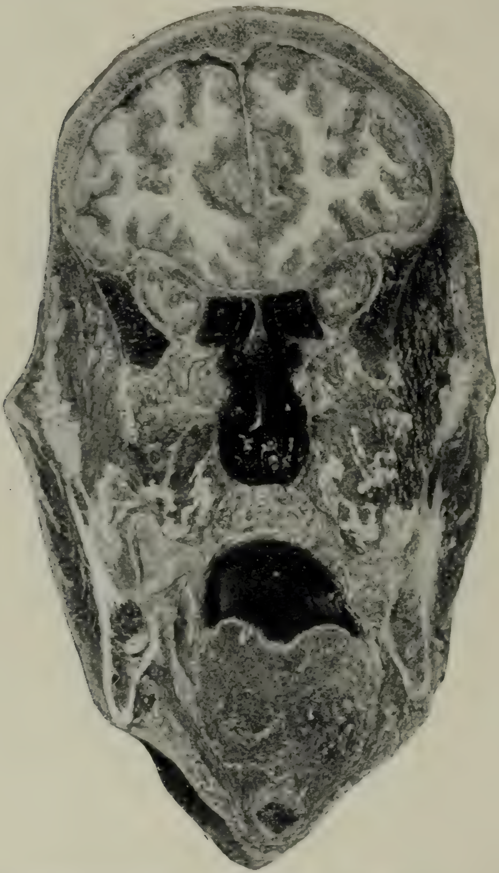


Transverse section of head showing the naso-pharyngeal space filled with adenoid tissue.

In conclusion, your writer wishes to emphasize the importance of proper care of the mother from the time of or even before conception, through pregnancy and parturition, and up to the time of weaning the child. The infant should, as before stated, be carefully examined at the time of birth to ascertain whether the jaws are in normal position and otherwise uninjured, and afterward the growing child should be watched closely in regard to its general health and care given to the deciduous teeth, to see that they do not become diseased or have any detrimental influence upon the health of the child until they are shed. The permanent teeth should be carefully guarded against disease, and every possible effort exerted in order to insure their occupying positions in correct alignment, a condition without which correct occlusion cannot exist.

The parents, the physician, and the dentist, one or all of them, through neglect, are responsible for the majority of the deformities of the jaws and of other portions of the face, and the disturbances of function which arise therefrom.

Fig. 17



Transverse section of head showing the position of the tongue when the mouth is opened.

CORRECTING DENTAL IRREGULARITIES BY THE JACKSON SYSTEM.

By V. H. JACKSON, M.D., D.D.S., New York, N. Y.

(Read before the New York Odontological Society, at its regular monthly meeting, April 1906.)

IN preparing a paper for this evening I was somewhat uncertain as to what would be of the most value to say regarding my system of correcting irregularities of the teeth. Incidentally, a paper that, taken together with remarks that I made in connection with it, I consider among the best I have ever prepared, was presented by me before this society in 1887.* The paper was discussed by Drs. Atkinson, Kingsley, Dwinelle, Howe, Clark, Weld, and others. I shall take the liberty of making a few quotations from that paper that are pertinent to the subject before us this evening:

> It is my custom, before choosing the method to be pursued, to prepare models of the upper and lower teeth, that their articulation [occlusion] and the position of those to be moved can be more fully apprehended and the models preserved for future reference. The method that will cause the least pain and inconvenience to the patient, the least injury to the teeth and surrounding structures, interfere least with articulation [occlusion], and move the teeth to the position desired in the shortest time, should be adopted.
>
> I believe that as dentists and members of societies we should deal more with practical cases, and not speak so much as is common from a theoretical standpoint, if we wish best to assist our fellow dentists. With this feeling I have brought before you this evening several models illustrating the position of the teeth before and after regulating.

These remarks, gentlemen, agree with my opinion today.

CHOICE OF FORCES IN REGULATING—EFFECTS OF CONTINUOUS PRESSURE.

A number of statements regarding the laws of force had been made previous to that time. One author who had given preference to the screw or intermittent force for regulating purposes, termed its application the positive system, and enlarged upon intermittent force as analogous to the law of "labor and rest." In considering this view from a physiological standpoint, I made the following statement, which has been verified in my practice:

> The law of nature is that alternating pressure and relief cause hypertrophy, increased growth, hardening; while constant pressure causes atrophy or absorption. If you want absorption, you must keep up a constant pressure without intermission or rest. We want absorption of the alveolar process in cases of regulating.

The science of force should be thoroughly understood by the operator.

The tissues involved in regulating are tolerant of any kind of direct moderate force, whether constant or intermittent, excepting a force that is vacillating—that is, not having a definite fixed point of resistance and action, as is common in insecurely anchored regulating appliances, wedging of the teeth with rubber, etc., which produces an objectionable inflammation. The force for moving the teeth should be applied in such a manner that the device will not impinge too heavily on the gum tissues. In my experience, the force of a spring generated with slight variations in form is more effective, more agreeable to the patient, and requires less attention than other means.

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*Cosmos, 1887, vol. xxix, p. 373.

The physiological law that continuous pressure on any part of the body will cause absorption, while pressure alternating with rest will cause a building up, is fully as evident in the use of the chin-cap for changing the shape of the mandible, or lower jaw, as in the regulation of the teeth. When the bony tissues are dense, the application of the chin-cap at night only, say eight hours, and a rest during the remaining part of the day will avail little, for during the sixteen hours in a healthy person, nature will have had sufficient time to repair any injury to the bone that may have been caused by the continuous strain of the chin-cap during the night. For this reason, with the adult, the chin-cap should be worn continuously, or for at least eighteen or twenty hours out of the twenty-four. If force be applied but a few hours during the day and nature is able to resist it, the part of the jaw put under strain becomes more developed, and its walls are thickened; but for young patients the use of the chin-cap even for a limited number of hours in connection with apparatus in the mouth is generally effective.

Previous to 1887, and since that time, I have been urging upon the profession the use of the spring as a force in regulating, and it is especially gratifying to note its more general adoption in place of screw pressure.

My first case of regulating in New York was begun in 1880. The case was corrected by the use of a labio-buccal bar, then generally termed a long band, now sometimes called an expansion bar. The irregular teeth were drawn outward to the long band by ligatures. This process of regulating by the long band with ligatures, and the application of the jack-screw with collars on the teeth, I used for several years; later I depended more on plates supporting wire springs. My experience with springs in plates prepared me to look for a better anchorage, and I developed what I termed the "crib" system. The appliances were made by fitting a wire to the labial and lingual sides of the teeth in the arch for anchorage, connecting the two wires by soldering to them at intervals short arms of wire passing over the arch at the junction of the teeth. Later I devised my present system of anchorage by partial clasps and spring-clasp attachments.

MATERIALS.

For the partial clasps I am now using 18-karat gold plate rolled to No. 36 B. & S. standard wire gage. The spring clasps are made of No. 21 or 20 silver-nickel or platinoid wire.

The base-wires are of No. 14, 13, or 12 wire, usually of German silver. The latter metal is chosen for its rigidity, although it is sufficiently springy for the purposes required. The parts are united by solder, using either gold solder or else chemically pure tin with the soldering iron; the tin can be procured from a manufacturing chemist. When tin is used as a solder with gold partial clasps they should be sand-papered or stippled on the side on which the solder is to be applied to make a strong union.

When jeweler's soft solder is used for uniting the parts, the appliance is liable to tarnish, especially when there is acidity of the secretions, owing to the presence of lead, but from experience I have found that the appliance does not tarnish materially when chemically pure tin is used as solder in connection with gold partial clasps and silver-nickel, platinoid, or German silver wire. In other words, when the solder contains lead—which is always present in soft solder—there is more tendency to discoloration. Plating of the appliances with gold when soft solder is used has been discontinued, as there seems to be less chemical action when used in acid mouths. It is also thought that the wires are less conspicuous when left unplated.

Platinoid wire, which I introduced a few years since under the name of Columbian silver, when well drawn has proved to be tougher, more serviceable, and less liable to tarnish than German silver.

Silver-nickel is a compound metal that I have been instrumental in having placed on the market for regulating purposes. When well drawn it is springy and tenacious, and generally keeps bright when used in connection with gold partial clasps. It takes its name from its silvery appearance. In reality, I think it is a form of German silver with a larger percentage of nickel than is found in German silver or platinoid. It is practically insoluble in commercial hydrochloric or sulfuric acid, and is but slightly soluble in nitric acid. Its fusing-point is so high that pure gold can be flowed over it. It is serviceable and is being used for many purposes in dentistry, as crown-posts, porcelain fusing-pans, etc.

APPLICABILITY OF THIS METHOD OF ANCHORAGE.

As most of you are familiar with the general features of my system of correcting irregularities of the teeth, I think that I will not refer especially to the technique involved in the construction of appliances this evening, but will deal rather with the applicability of the method of anchorage, although one must understand the technique of making the appliances in order to get satisfactory results. This should not discourage anyone, as the making of the appliances is simple; it takes much less time to make and insert the appliance than to adjust any other apparatus with which I am familiar. Again, we have been trained to look after the technique in all dental operations—as the technique of making gold fillings, the technique of crown and bridge work, the technique of porcelain inlay work; in fact, at the present time the advancement of any branch of dentistry depends upon the more thorough knowledge of the technique.

The method of anchorage makes the appliances applicable for the regulation of the teeth for persons of any age—for the child of six or seven years, as well as the adult of sixty.

The apparatus is one of the best for retaining the teeth after their regulation, and for supporting teeth loosened from pyorrhea.

The appliance is removable, but it is constructed in such a manner as to be suspended by the teeth—preventing it, when well made, from being forced against the gum in the process of mastication. There should be no soreness or discomfort experienced from it.

The force of the springs is well under control, moving the teeth only as far as it is planned to move them, making the method an exact one. The extent of the movement of the springs is determined by first laying the appliance on a paper or thin piece of cardboard and tracing its outlines by the use of a sharp-pointed pencil, making a drawing or chart. A mark is then made beside each spring, indicating the distance that they are to be moved for causing force; then the springs of the appliance are bent to conform to the marking. At subsequent visits, when changes in the form of the springs are desired, other marks are made indicating the distance the springs are to be bent, and the date of the change noted.

I have continually advocated the early regulation of the teeth—that is, while they are erupting and the bone and process are in the formative stage. This certainly is a rational principle. If the arch needs expansion, it should be done while nature is at the height of activity in the deposit of bone in these parts.

ILLUSTRATIONS.

The accompanying casts, Nos. 1 and 2, illustrate the irregular position of the upper and lower teeth of Miss P., age ten years. Both upper and lower arches required lateral expansion to provide room for the irregular incisors and canines. The first bicuspids were just erupting, but were not sufficiently through the gum for the attachment of collars or ligatures. The second deciduous molars were still present in both arches.

The upper arch (cast No. 3) was expanded by an appliance with a palatal base-wire crossing the distal part of the arch where it was broad enough. The ends of the base-wire were bent forward to form arms. The arms were soldered in the anchorage portions, which consisted of partial clasps and spring-clasp attachments. The arch was expanded laterally by slightly bending the arms outward from time to time. As space was made, the irregular incisors were forced into line by finger-springs that extended forward from the anchorage, one on each side of the arch.

Cast No. 4 shows the position of the teeth in the upper arch after nine visits, at intervals of about a week.

Fig. 1.

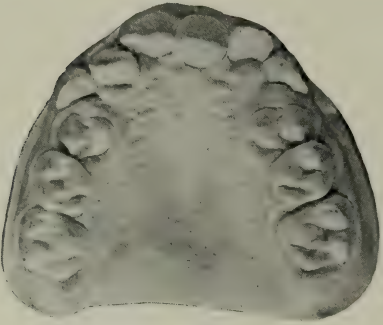


Fig. 2.

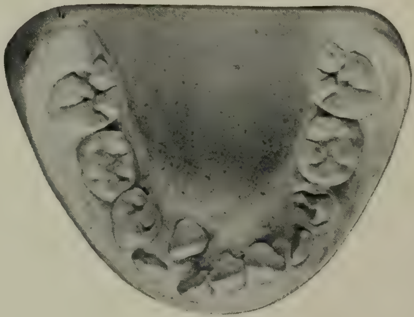


Fig. 3.

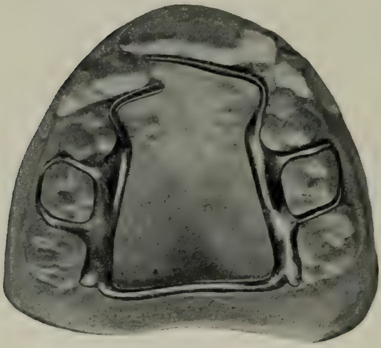


Fig. 4.

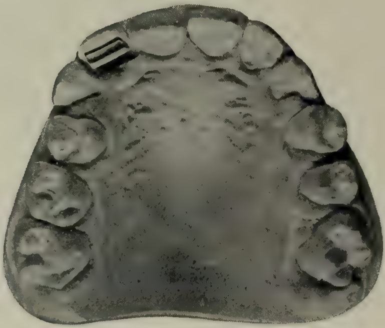


Fig. 5.

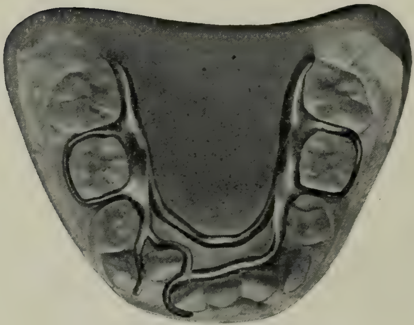
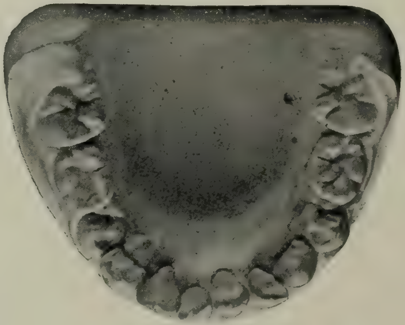
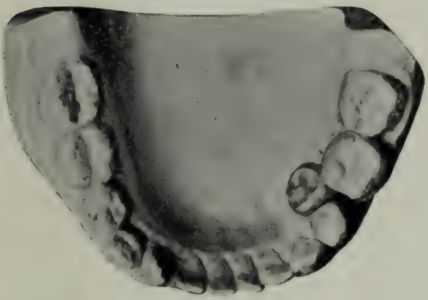


Fig. 6.



Cast No. 5 illustrates the appliance used for the correction of the teeth of the lower arch. It was inserted four weeks after the introduction of the upper appliance. The arch was narrow and there was insufficient room for the right lateral incisor, which was back of the central incisor. The central incisor rested very near the erupting permanent canine, and was much to the right of the median line. The appliance was made with a lingual base-wire, with arms extending backward to enter the center of the anchorage portions. Wire springs were extended forward from the anchorages to hook about the teeth like fingers, in such a manner as to broaden the space between the right incisor and the canine. Force for expanding the arch laterally was obtained by bending outward the arms of the base-wire, at the same time moving three of the incisors toward the left and one lateral incisor and the canine toward the right.

FIG. 7.



Cast No. 6 illustrates the position of the lower teeth after five visits.

The object of including a description of this and the following cases is to show how easily difficult work can be accomplished without discomfort to the patient. It requires but a few moments to add force to the springs and readjust the appliances. They are removed by the patient at least twice a day for thorough cleansing.

Expansion of the arch is required in a large percentage of cases.

I now present cast No. 7, that of the lower teeth of Miss B., age eighteen years. The arch required anterior expansion, moving forward the incisors, the canines, and the left first bicuspid sufficiently to admit the left second bicuspid, which was erupted entirely inside of the line of the arch, the first bicuspid resting next to the first molar.

Cast No. 8 illustrates the style of apparatus used for this movement, in position on the cast. The appliance shown in Fig. 9 was made with a lingual base-wire, anchored by partial clasps and spring-clasp attachments similar to those shown in Fig. 5. The base-wire was curved downward and inward opposite the irregular bicuspid. To obtain space for it, a looped spring about No. 18 gage extended forward from the anchorage to the molars, passing around the lingual side of the instanding bicuspid, and being curved over the arch to the buccal side, back of the first bicuspid, resting on the distal surface. Another spring was arranged on the lingual side to rest below this for forcing the bicuspid outward as space in the arch was made for its accommodation. A long finger-spring extended from the anchorage on the right side of the arch and rested on the lingual surface of the incisors and canines

FIG. 8.

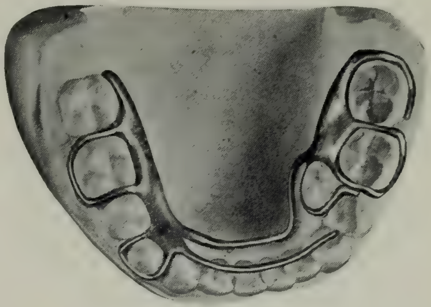
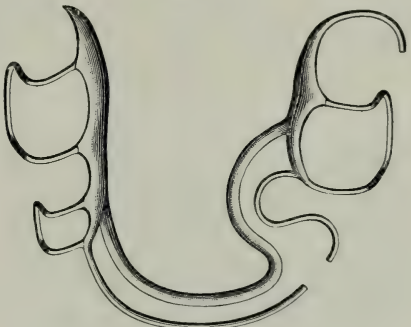
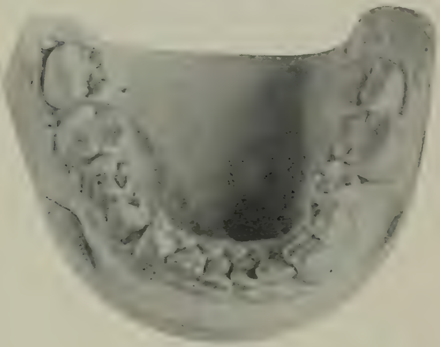


FIG. 9



for moving them outward. The free end of this spring was finally supported by a lug on a collar that was cemented to the left canine. Force was caused by bending forward and outward the ends of the springs.

Fig. 10.



Cast No. 10 illustrates the condition of the arch after fifteen visits, space having been obtained and the bicuspid moved outward nearly to position.

EQUALIZING THE JAWS.

In a paper that I read before the National Dental Association (see Cosmos for March 1906), I described the general plan of my method of equalizing the jaws. The appliances are removable by the patient for cleansing. They are so constructed that the expansion of the arch and the general alignment of the teeth can be accomplished at the same time the jaws are being equalized. The anchorage is such that force can be applied to any particular teeth, as to the molars and bicuspids, or include the incisors and canines—as, for example, with the prominent upper jaw the anterior part is usually too narrow, requiring lateral expansion. The arch can be expanded and the incisors forced inward or moved outward, at the same time the lower jaw or teeth are being brought forward for "jumping the bite" or improving the occlusion.

When the upper incisors have been moved inward sufficiently to make the arch of correct form, the front portion of the appliance, or the loops of the labial spring utilized for moving the teeth inward, are made rigid by soldering to them pieces of metal for stiffening them, thus causing all of the force of the equalizing bands to be imparted to the molars, bicuspids, and canines, and not to the incisors that have been moved—relieving them of the tendency to crimp.

It often occurs that the occlusion is correct on one side of the arch and not on the other. In the case of Miss S., age twenty years—the models and appliances of which, upper and lower (cast No. 11), I here present—the occlusion of the teeth required that the upper incisors be moved outward, and the molars, bicuspids, and canine on the left side be moved backward in the line of the arch, while the teeth of the lower arch on that side

Fig. 11.

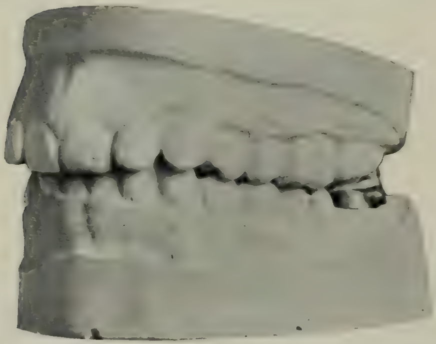
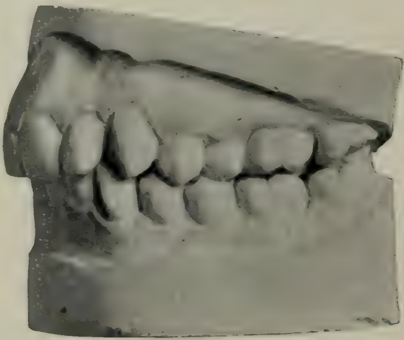


Fig. 12.



needed to be moved forward. These movements were accomplished in ten visits, as shown by cast No. 12.

The appliance for the lower arch (Fig. 13) was made with a lingual base-wire connecting the anchorage portions, which consisted of partial clasps and spring-clasp attachments in the usual manner, with a wire clasp extending from the anchorage around the last-erupted molar to the buccal side, where it was formed into a hook.

FIG. 13.

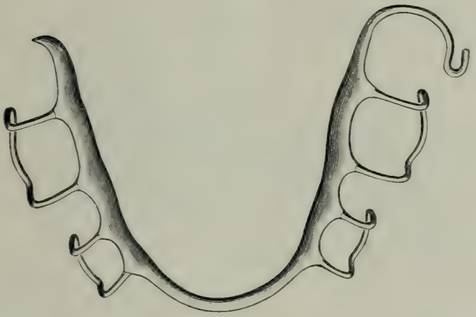
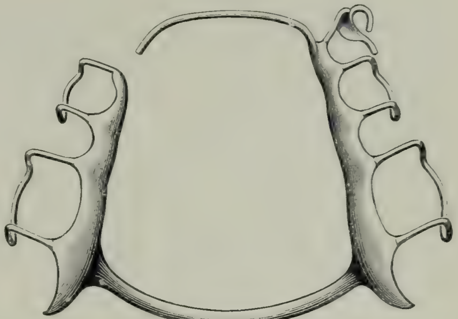


FIG. 14.



The appliance for the upper arch (Fig. 14) was retained by partial clasps and spring-clasp attachments to the bicuspid and molar teeth. A palatal base-wire connected the anchorage portions. From the anchorage on one side a curved finger-spring extended forward and rested on the lingual side of the incisors for moving them outward. From the anchorage on the left side a wire of No. 18 gage was shaped to pass over the arch just in front of the canine tooth at the junction with the lateral incisor, from the lingual to the labial side, where it was attached with solder to a small partial clasp that was fitted to the mesiolabial surface of the canine. At the same time a small wire hook was soldered to the partial clasp for supporting a rubber equalizing band. The band was stretched from the hook of the lower appliance to the hook of the upper. The anchorage of the appliances was not disturbed even though two rubber bands were used at once a portion of the time. As a rule, in such a case it is better to strengthen the anchorage by cementing to the last molar a collar with a small lug located on the bucco-distal surface, with the end of the wire clasp arranged to catch under the lug. In removing the appliance, the patient first forces the spring backward and upward by pressing the thumb against the hook portion to disengage it from the lug. It will be noted that with this arrangement the greater the traction caused by the equalizing band, the more firmly the wire clasp is held by the lug, so that there is no possibility of disturbance of the anchorage.

When the opposite movement is desired—namely, forcing the lower teeth backward in the line of the arch and the upper teeth forward—a collar with a lug as described should generally be cemented to the last upper molar, and in other instances a collar with a lug should be cemented to the lower lateral incisor or canine for steadying the appliance as force is applied.

ORTHODONTIA AS APPLIED TO THE EXTRACTION OF AN IMPACTED THIRD MOLAR.

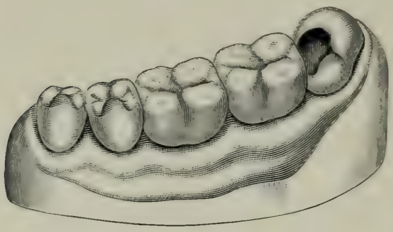
By **T. S. WATERS, D.D.S., Baltimore, Md.**

(Clinic at the union meeting of the Maryland State Dental Association and the District of Columbia Dental Society, at Washington, June 7, 1906.)

I DESIRE to call your attention to the manner in which, by availing myself of the possibilities of orthodontia, I moved a lower left third molar from its impacted position into one from which it was extracted without injury to the second molar, the tooth against which it was solidly wedged.

The partial casts shown herewith are from the mouth of a patient thirty-three years of age. As may readily be seen in Fig. 1, the lower left third molar occupied a decidedly abnormal position.

Fig. 1.



After obtaining an impression of the left side of the lower arch, and preparing therefrom a suitable plaster cast, a crib was made to accurately fit the first and second molars, and after cementing it upon these teeth it constituted the fulcrum or anchorage of the appliance. (Fig. 2.) The labial side of the crib is provided with two eyelets, oval in shape, into which is fitted a threaded bar also oval in shape. (Fig. 3.)

A nut was placed between the two eyelets, and the bar was fitted to a cavity in the tooth. By screwing the nut forward, a degree of pressure was brought upon the tooth, which being pushed backward and upward, was eventually made to occupy a position such as enabled it to be extracted without difficulty and without

Fig. 2.

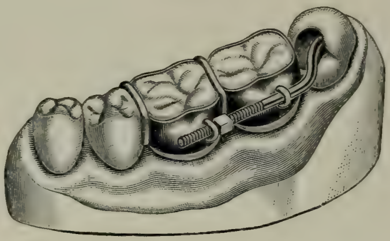


Fig. 3.

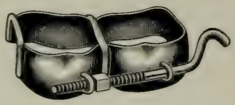


Fig. 4.

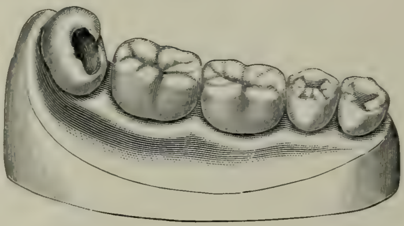
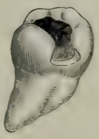


Fig. 5.



injury to the second molar. (Figs. 4 and 5.) It required just twelve days from the time the appliance was inserted to move the tooth into the proper position for extraction.

This case exemplifies the possibilities of orthodontia technique as applied to the extraction of teeth, and should commend itself for adoption in all cases in which the sacrificing of the second molar is contemplated, as it makes possible the extraction of the third molar without any injury whatever to its immediate neighbor.

Judgment must be exercised in all these cases, and palliative treatment given to relieve suffering which will occur if too much pressure be applied suddenly.

Treatment. Bathe the gum daily with a saturated solution of iodin in glycerin, adding aconite and chloroform, twenty to thirty drops of each to the ounce of solution.

METABOLISM AS A CONNECTING LINK BETWEEN DENTAL SURGERY AND GENERAL MEDICINE.

By L. ASHLEY FAUGHT, D.D.S., Philadelphia, Pa.

(Read before the Pennsylvania State Dental Society, at its thirty-eighth annual meeting, Philadelphia, Pa., June 26, 1906.)

THE current literature of any profession reflects the status of that profession. The researches of the most active minds engaged in the practice of that profession, and the vital questions of the hour attracting their thought and attention, are here recorded. To this record, as to a gage, one at any stage may turn and learn of the degrees of professional progress. What Dentistry was, what it is, and in a measure what it will become, may therefore thus be definitely traced.

Not to him who reads of the present only, but rather to the thoughtful mind taking a comprehensive review, is the interesting picture of its evolution revealed. Seventy years ago dental surgery proposed to begin as a specialty of general medicine, for the thought presented itself to the few intelligent men then engaged in operations upon the teeth that the care of these organs was worthy of the attention of medicine, and overtures were made by them to the medical faculty to give dentistry consideration. The idea, however, was in advance of the age, and the relationship was not apparent to the medical profession. Today dental surgery does not stand asking this incorporation, for the then divergent line has by the force of its own evolution become so convergent that, without any desire by the one party or acceptance by the other, this most peculiar and far-reaching specialty of medicine will in the near future be accepted as such by the world without specific thought or attention to the fact.

The forces producing this condition are many and various, and lie scattered all along the converging line. Two of them perhaps stand out more markedly than the rest, one strictly surgical and the other strictly medical. The orthopedic treatment of the face as embodied in orthodontia is the surgical factor, and the medical factor is to be found in the diseases of metabolism.

Before entering into any consideration of metabolism and its intricate and interesting relationships to dental surgery as developing in general medicine, let us in our minds go back to about the year 1835, when dentistry entered upon its career as dental surgery, and in concise review look over the evolution which makes it important to note that dentistry today is not composed of two-thirds manual training and one-third surgical science, but includes the wide medical knowledge so necessary to treat diseases consecutive to disturbances of the teeth, viz, diseases of the gums, of the jaws, of the maxillary sinuses, etc. This evolution necessarily creates a division into technical dentistry, surgical dentistry, and medical dentistry.

Recognizing that men deserving well of the republic of letters, even though not educated in a medical college, yet being learned in the discipline of good arts from another source, should be distinguished from others by a conferred title, the degree of Doctor of Dental Surgery was deemed proper, because relief from the distress of "decayed" teeth was to be had by extraction, and this removal was surgical in its nature. Further, relief under certain conditions was given by filling the cavity of decay, and this being a mechanical procedure was surgical in its nature. A demand was created, by the loss of teeth, for their artificial replacement, and the making and insertion of appliances for this purpose seemed to be surgical also. For cosmetic effect an irregular tooth was occasionally drawn into better position, and this too was of the nature of surgical intervention. Dentistry was thus naturally branded "dental surgery," and the literature of the new profession dealt with the daily conditions of its practice—the methods of making artificial dentures, the procedures involved in extraction, the medicaments for the relief of toothache, the questions of tooth-stoppings, the qualities of soft or adhesive gold, amalgams, gutta-perchas, cements. No wonder the medical profession saw little of their own methods, either medical or surgical, involved in all this.

Slowly but surely through the years devoted to these things a new era was developing, and as a knowledge of anatomy and physiology was attained, a constant undercurrent of thought was working out something better and higher. In due course it came about that a tooth was not simply to be filled, but it needed to be filled with due consideration of its chemic relationships and with attention to its occlusal and approximal shapes; its functional purpose must be retained or restored. Artificial teeth were not to be inserted into mouths as simple replacements, but they must restore the functional purposes of teeth. Cosmetic effects were no longer the only motive for the treatment of irregular teeth. The secrets of occlusal relationship are studied and the intentions of nature along full functional lines recognized, and these must fully be met in the treatment given. Dentistry then was truly becoming surgical.

A little farther on, the domains of the rhinologist and the laryngologist are touched and overlapped. Bacteriology is studied, and later, as a fitting outcome of this development, a jump is taken as it were into the future, and dental prophylaxis becomes the watchword of the present hour, not only of the dental surgeon but also of the general surgeon; another overlapping. Functional restoration in every direction having been obtained, functional activity is to be maintained.

Prevention, the brightest star in the medical circlet of today, shines, too, in the diadem of dentistry, and the highest pinnacle would seem to have been reached were it not that, as dentistry has developed, civilization has also at the same time engrafted a strenuous life upon the people. Systemic disturbances have resulted which have such dental and oral manifestations as to demand the attention of the dentist as well as of the practitioner of general medicine. Peculiar as it may be, these are not truly diseases of dental origin requiring general medical treatment, but medical diseases with dental and oral manifestations—diseases which proclaim in the oral cavity, unseen by the physician, often very far in advance of any knowledge by the patient or of any other notable signs of their presence, a tocsin of warning to be recognized by the dentist and demanding treatment at his hands. The practitioner of dental surgery is thus now forced over into the domain of general medicine.

The diseases referred to center in and around metabolism. The dentist must today comprehend the influence of the trophic nerves and the questions of normal secretion and excretion, the maintenance of a proper balance between waste and repair, the influences of the blood, its composition, and the disturbances of its circulation. Hepatic and renal conditions must be considered. Analyses of saliva and urine must be made and interpreted. At the end of seventy years of such evolutionary progress the medical faculty is welcoming its brothers in the healing art with open arms, and no longer looks askance, for dentistry has demonstrated that it is a specialty of medicine; a peculiar specialty it may be and is, but now not strictly surgical, and the day is at hand when the term dental surgeon must give way and be replaced by stomatologist, as indicative of one who treats his cases with the broadest culture. Dental colleges will then have added to the present curriculum by training students in such general medicine as has been outlined.

When this climax occurs, the propriety of the present attempt to divide dentistry into specialties may be questioned and may call for readjustment, for a specialty of a specialty would be somewhat incongruous! All such division undoubtedly develops technique, but this development of technique has already given evidence of a tendency to produce a narrower field of vision—by which, not infrequently, in the accomplishment of a particular purpose, are deranged the organic functions of the oral cavity.

The technique of crowns, bridges, artificial dentures, and appliances of orthodontia must surely continue, for they are necessities, and consequently will continue to segregate artisans to produce them. However, this issue may safely be left to the control of that same evolutionary force which has already done so much for our uplifting, and which undoubtedly will prove abundantly potent to properly regulate the matter.

I have allowed myself this considerable liberty in approaching what I may say touching *metabolism,* for the reason that I wanted to bring you, as it were, into the atmosphere of the thought which led me to choose the topic for our consideration at this time. The diseases of metabolism are at our door, and it is not a theory but an actual condition which confronts us, and the evolution of our existence asks us to measure up to the occasion. It is well, therefore, to recognize the topic as intensely practical and not theoretical, and to search the accumulated experience of others as presented by medical writers, to the gaining of a condensed yet comprehensive knowledge which shall enable us to deal wisely and successfully with these diseases.

The study of metabolism is the study of an intricate and important subject. The term indicates the changes occurring when living organisms by inherent functional power take substances derived from food into their tissues and make them a part of themselves—an uplifting by which living material vitalizes crude nutritive material, or increases molecular complexity: anabolism. It further has to deal with the removal of broken-down material, waste material the result of this nutritional process—a change in the opposite direction, decreasing molecular complexity: catabolism. In two words: assimilation, excretion.

The study of the individual is really the study of the cell, and the assimilative and dissimilative changes taken together are nutrition—metabolism. Food decomposition does not take place in the blood and fluids, but in the tissues, where the decomposition is brought about by the chemical activity of the cells. The destination of food is the growth and renovation of the component parts of the body and the production of heat and energy. For these purposes the actual seat of utilization is within the protoplasmic or biogenic molecules constituting the basis of living matter. It is here that the active changes of life occur. Food elements on the one hand and oxygen on the other enter the large and highly complex molecules of which protoplasm is composed, and through the play of changes ensuing, the phenomena of life are evolved. As an outcome of this proposition, the food material has to reach these protoplasmic molecules, and in so doing traverses the circulatory system. Modern research shows that what has to be dealt with is something far otherwise than a simple passage of nutrient chemical principles into the blood at the seat of absorption. Solid matter requires to be brought into a liquid state, and all nutrient principles to be placed in a condition to which the property of diffusibility belongs. This is effected by enzyme action, the enzymes being products of secretion of the digestive system, adjusted by nature to accomplish the purposes required to be fulfilled.

Digestion is the preparation of food for absorption, but ideas regarding what is needed to permit of entry into living protoplasm, and thence of taking part in the metabolic changes occurring, have in recent times undergone great development. Formerly it was considered sufficient to regard digestion as bringing the food into a liquid or diffusible state so as to permit of the occurrence of absorption in compliance with the physical laws of osmosis. The effect of modern research, however, is to show that it is by the instrumentality of cell action instead of by physical osmosis that the products of digestion pass into the system, and absorption may be said to mean bioplasmic incorporation, the absorbed material passing into and becoming a component of living matter—in other words, assimilated. The process of digestion not only reduces the size of molecules to give the property of diffusibility, but also sees that the molecules produced should be of such construction as to be adapted to unite with those into which they are intended to become incorporated. It is the province of the enzymes to bring about this adaptation, and unless it is brought about there can be no combination. This having been effected, the union takes place by virtue of affinity—affinity dependent upon molecular configuration. Under this view of physiologic metabolism, as set forth by Pavy, the food principles are in the first instance constructed by assimilative action into the principles of the blood. The blood feeds upon the food supplied from without, and the tissues feed upon the blood. Among the recognized components of the blood are the corpuscular elements, and these are now found to be more varied than as set forth by the old division into the red and white corpuscles. It is through these elements that the prepared material is taken to the appropriating tissues. Oxygen is taken in by the hemoglobin, and in a state of combination transported to the tissues, where it is taken off and applied to utilization.

When the physiologic procedure the outline of which I have just recited takes place, the organic portions of food, known as nitrogenous and non-nitrogenous, the one being proteid and the other being fats and carbohydrates, become lost to sight after being ingested; on the other hand, when for any reason this process is disturbed, certain conditions result and pathology steps in to account for the disturbance.

It is therefore necessary that the dentist have a clear comprehension of the normal conditions of nutrition, that he may not be led into erroneous interpretations of pathologic conditions; for the knowledge of the one is immediately involved as a basis by which to read correctly the other. He may make local applications again and again without any possibility of curing the case which has come to him for treatment. Nothing but personal mortification and professional stultification can be the result. He can only treat successfully as he is able to pass into the broad domain of pathology, lay his finger upon the disturbing cause, and correct the attendant abnormal condition arising therefrom.

Some of the diseases of the uric acid diathesis perhaps may be taken as a fair illustration of the point asserted, and also as illustrative at the same time of the loose, disjointed training in general medicine evidenced on the part of many of the dentists who in the last decade have essayed to write on this subject. A review of the many articles written and published in our literature shows a lack of accurate knowledge which has not infrequently led to an unwitting misstatement of fact.

Wm. Henry Porter points out that uric acid is formed normally and solely by a process of oxidation, and that uric acid never exists in foodstuffs, and also that there is no method known to chemistry by which we can logically and accurately assume that the uric acid exists in the blood. The proteid molecule, in its isomeric transition through the system, often reaches the condition in which it is more easily oxidized into a uric acid molecule than into urea. None can deny, however, that an antecedent is not a finished product.

Accepting this theory of oxidation reduction of a certain isomeric form of the proteid molecule in the renal cells, it is easy to explain the presence of uric acid and the formation of urates, together with the production of the insoluble phosphate of calcium urate deposited at various points of the body outside the renal structures. The disturbance of metabolism that is concomitant with this condition results in certain instances in a vicarious action on the part of the various protoplasmic structures throughout the animal economy. As a natural sequence of this vicarious action and imperfect oxidation reduction, uric acid is produced suddenly and unexpectedly at various points in the body. Following this sudden formation of uric acid, there is produced at these local points urates which are either the insoluble phosphate or calcium urate, or both.

To understand fully this instantaneous formation of the urate and the necessity for the production of uric acid in the renal cells, we must at the same time follow the so-called alkaline phosphates in their transit through the system. The normal phosphate of the blood is a neutral salt, and the one in the urine is an acid salt. The presence of the neutral sodium phosphate in the urine tends to hold the uric acid in solution, but at the same time, it favors a deposition of the earthy phosphates, and thus has a tendency to excite the formation of phosphatic calculi. Therefore, it is essential to rid the urine of this salt, and to secure in its place one which will hold the earthy phosphates in solution, destroying the irritating properties of a strong solution of uric acid. The uric acid, as it is formed and discharged from the renal cells, comes in contact with the neutral sodium phosphate, which is constantly escaping from the blood into the uriniferous tubules, with the development of a sodium urate and the formation of the sodium acid phosphate in place of the neutral salt.

The practical aspect of the subject is that an over-production of uric acid is always dependent upon three general principles:

(1) A defective oxygen supply.

(2) Taking into the system more food than can be perfectly oxidized.

(3) Disturbances in the action of the nervous mechanism.

I have given this view of Professor Porter at some length, but I think sufficiently succinctly to clear your minds, and hereafter our papers and discussions, of the idea that uric acid as such exists in the blood.

The process of oxidation as a potent factor in metabolism must not be lost to mind, and it is as necessary for us that the carbonic acid produced as a result of the operations of life should be conveyed from the tissues to the lungs for discharge as that oxygen should be conveyed from the lungs to the tissues. The sodium carbonate and phosphate are the agency mainly affecting the conveyance of carbonic acid to the lungs for its discharge. The appropriation, therefore, in any way, through faulty metabolism, of the sodic alkali is of serious import. Faulty metabolism also often takes the form of a deficient absorption of fats, and this form is more far-reaching in its effects than is generally recognized. The fats supply the heat or energy which the body demands. Proteids, to be found in all lean meats, cheese, eggs, milk, and vegetables, furnish both energy and tissue-making material. The tendency of the body is to first assimilate heat or energy for the performance of its functions, and it will draw the necessary amount from the proteids if it have not a sufficient supply of fats, with the result that tissue-building is neglected for want of material. It is therefore important to know this fact, and it is often necessary to see that fats are supplied that they may act as proteid-sparers. The apparently indicated requirement of large quantities of proteids will not fully meet the conditions.

It is not germane to the narrow limits of this paper to specifically consider further the wide range of general pathological disturbances with which the dentist should be familiar because they present the first shadows of their existence within the oral cavity. Sufficient to the occasion is it that indication has been made of the possibility of diagnosis of systemic disturbances through mouth-conditions, and the trend of such familiarity to bring about a most intimate relationship between the dentist and the medical practitioner. Everything at the present hour points to the fact that the future of dentistry lies not in the narrowing confines of developing technique, but in the additional important cultivation of broad medical training.

So true is this fact that the student will have a decided advantage who is fortunate enough to pursue his initial studies of dentistry in institutions connected with medical colleges and hospitals, inasmuch as they can afford him advantages and opportunities for elaborate researches which he cannot obtain in any other way. The atmosphere of medical thought, and the fully equipped physiological and pathological laboratories, lead to investigative action, and must surely produce men who are not likely to lay aside study and research with their day of graduation; and undoubtedly the field of metabolism is sufficiently attractive, and it is to be the connecting link between dental surgery and general medicine.

In conclusion, I wish to give credit to the works of Brubaker, Hare, Pavy, Hofmeister, Porter, Hewlett, Weintraud, and Von Noorden, from whom I have freely drawn in the preparation of this paper.

PORCELAIN BRIDGES WITHOUT REMOVAL OF THE PULP.

By GUY VINTON SMITH, D.D.S., Aurora, Ill.

OF late, advanced steps have been taken in the development of porcelain bridges, either with or without a platinum foundation. In this paper I wish to speak of the advantages of porcelain bridges over those of gold, and also of the prosthetic technique of the porcelain bridge.

In the first place, porcelain bridges have the advantage of being more durable under the stress of mastication than gold ones, and they are as serviceable as gold if the porcelain be properly manipulated. A four- or five-tooth porcelain bridge with no metal used whatsoever has been proved as durable and more lasting than a gold one. The durability of porcelain depends not alone upon the manipulation of this material or upon its density, but upon the quality of the porcelain. In my estimation, the higher the fusing-point of the porcelain, if it is properly baked, the greater the value it has over the low or medium-fusing porcelain. Having used a number of porcelains, I think I can safely say that a porcelain fusing at 2650° Fahrenheit is the most suitable one for bridge work.

Again, porcelain is not so ghostly to look upon as a bridge backed with gold, or one with gold abutments and bands. This needs no further comment.

Porcelain is more pleasing to the gum tissues than a gold band at the gingival neck of an abutment. The gum tissues seem to recede from the gold, while when porcelain is used at the gingival margin it conforms itself about it, and after the irritation of cementing the bridge subsides it assumes the same appearance as the adjacent teeth.

PROSTHETIC TECHNIQUE.

And now I will take up the prosthetic technique of the porcelain bridge, for thereby we cannot help seeing its advantages over a gold bridge.

A porcelain bridge with a platinum foundation is naturally stronger than the one devoid of a metallic famework. This work is advocated in the extensive bridges, but the smaller ones may be constructed of porcelain without the aid of platinum. A bridge, as we all know, is the assembling of one or more dummies with two or more piers or abutments. I will not comment upon the advisability of placing a porcelain jacket crown upon a live pulp, as all are aware that it has been successfully done. In making the porcelain bridge with a platinum foundation the abutment should be treated similarly as for the placing of a Spaulding jacket crown. A die and counter-die is correctly obtained of the prepared abutments, then a platinum plate of No. 30 gage is swaged to the die. These matrices are then placed upon the crown of the teeth and trimmed to the ledge at the gingival line. A square platinum bar, No. 14, with one or more uprights for the support of the porcelain dummies, is then correctly fitted between the abutments and soldered with platinum solder. Thus we have a platinum foundation preparatory to the manipulation of the porcelain. With this foundation there is no possible chance of the displacement of the matrices, which fit snugly about the abutments.

We can now proceed to build our porcelain by whatever method we choose. It may be the Spaulding jacket method with ground facings for the abutments and dummies, filling in with porcelain to the required contouring and occlusion, or by a special method I have of building and contouring the abutments and dummies while the platinum foundation is within the patient's mouth. We all know that the porcelain will shrink, and it will be necessary to build on more porcelain and contour many times before the correct occlusion is obtained. The prosthetic technique of the above has been very briefly described, but one could better comprehend it by a demonstration.

In building a porcelain bridge without a platinum foundation, the abutments are ground similarly to the description above. Then a platinum matrix, one-thousandth of an inch fine, is burnished to the crown of each pier, and our Spaulding jacket crown is constructed. When one abutment is baked to a biscuit finish we can join an adjacent dummy to it without destroying its relation. Where the two parts of the bridge have shrunk and still retain their contour and occlusion we can join them by placing porcelain in the intervening space and building the bridge to its intended contour and occlusion. The question as to shrinkage, which disturbs the occlusion, is often asked. If the manipulation of the porcelain has been properly carried out and the intervening spaces are infinitely small, when they are filled with porcelain the shrinkage will be reduced to a minimum. During the last year I have made a few bridges of this last type and have had notable success. The shrinkage was unnoticeable when I tried the bridge preparatory to cementing it, as the jacket crown abutments fitted perfectly.

A WORD ON THE BAKING.

Before concluding I wish to say that much of the success as to durability of porcelain bridges is due to the baking of the porcelain. If it be overbaked, the bridge is almost sure to crack under the stress of mastication and in time to fall away. I have seen many examples of this kind. It is far better that the bridge be underbaked than overbaked, as in the former case the resistance of the porcelain would be greater than when overfused. One can soon ascertain the proper baking after a few attempts.

As for the value derivable from the prosthetic side of this paper, I am afraid there is something wanting, as it is most difficult to depict the process of baking and manipulating porcelain so as to obtain the least shrinkage, but I cannot speak too highly of the possibilities attainable from the use of porcelain in the construction of bridges.

IS ORAL CLEANLINESS THE CHIEF FACTOR IN THE PROPHYLACTIC TREATMENT OF DENTAL CARIES?

By **I. N. BROOMELL, D.D.S., Philadelphia, Pa.**

(Read before the Pennsylvania State Dental Society, at its thirty-eighth annual meeting, Philadelphia, June 26, 1906.)

AT the April meeting of the Academy of Stomatology a paper was read by Dr. S. B. Luckie dealing with the subject of oral prophylaxis. During the discussion of that paper—which, by the way, was most able from the author's standpoint—I made some remarks which were rather forcibly criticized, and it was largely this circumstance which provoked the preparation of this paper. The argument which it was intended to bring out at that time was that designated by the title of this essay.

Being fully convinced that cleanliness of the mouth is very much less important as a combating factor in the etiology of caries of the teeth than is generally supposed, and being equally confident that systemic conditions through their influences over the hard structures of the teeth are chiefly responsible for making caries possible, I shall proceed to point out why I believe this to be true. In attempting to do this the inference must not be drawn that uncleanliness in the oral cavity is favored, because this is far from correct. Nor will there be any attempt to take exception to the established facts regarding the etiology of caries, the present object being to consider the subject from the standpoint of the conditions which make caries possible.

First let us employ a few commonplace arguments to strengthen the assertion already made, that cleanliness of the tooth-surfaces does not insure immunity to decay of those surfaces; in other words, that a prophylactic effect is not assured in this way.

CARIES AND THE EARLIER RACES OF MEN.

It is a well-known fact that the early races and tribes—who are generally believed to have been physically very much superior to later generations, and who had but little knowledge of hygienic laws in general, and therefore we may assume gave no special attention to oral cleanliness—suffered but little from tooth-deterioration as compared with the destructive ravages of caries at the present day.

After the examination of a number of crania of the ancient European tribes, Professor Broca found that carious teeth were few in number, and that the only destructive process worthy of note was the mechanical abrasion noted on the occlusal surfaces and cutting edges. This fact afforded much information regarding the habits and dietary of these people; in other words, they observed a system of food-regulation especially intended to meet the requirements of the animal economy. They lived a life close to nature, and this in turn implied physical strength and freedom from the constitutional weaknesses common to our civilization of today.

Magitot, who made a very careful and exhaustive examination of the crania of Peruvians, Patagonians, and Mexicans, as well as of the aborigines of Madagascar and Australia, found no evidence of dental caries; and Placarre, who dwells at considerable length on the habits and customs of those early tribes, declares that they were careless in the extreme regarding personal cleanliness, and that chronic systemic ailments were to them unknown, or at least unrecorded. Here, therefore, are two simple arguments favorable to the idea that caries of the teeth at that early age at least was very much less prevalent than at the present day, notwithstanding the fact that no attention was given to oral cleanliness.

I am fully aware of the fact that if this paper provokes any discussion, exceptions to the foregoing will be taken based upon the fact that we are living in a different age and that for a variety of reasons—none of which, however, are fully established—human teeth may be said to be specially predisposed to decay. This I am willing to admit, but at the same time I am not willing to admit that caries is much more prevalent in unclean mouths than in those kept clean, providing the tissues of the teeth are endowed with equal resisting power—which resisting power is largely if not entirely controlled by systemic changes, or vital forces.

There is no disposition upon the part of the writer to convey the impression that the lack of oral cleanliness is in no wise responsible for the establishment or progress of caries. This condition is unquestionably a factor, but it is believed to be of secondary importance.

THE ORAL CONDITIONS ESSENTIAL TO BACTERIAL ACTION.

It is a well-known fact that two conditions are essential to the generation and growth of bacteria—heat and moisture; and these are just as essential in the mouth as in other parts of the body. Heat and moisture alone, however, will not produce bacteria unless they are present in the right proportionate amounts. If heat be present without moisture, or moisture be present without heat, no germination will take place. Further than this, the character of the heat and the character of the moisture are factors which influence bacterial growth. It does not necessarily follow, therefore, that an unclean mouth will furnish a suitable culture field for the bacteria of dental caries; while, on the other hand, the cleanest mouth may present the conditions favorable to their germination and development.

This argument is one which covers that large class of individuals, with whom we are all well acquainted, who habitually fail to make even an attempt to keep their mouths clean, yet who, while their teeth may not be immune to caries, are found to be but slightly affected by tooth-decay, and that of a type exceedingly slow in its progress and frequently effecting its own cure. In this class of cases the food débris, dead epithelium, etc., are present in great amount, but the character and proportionate amount of heat and moisture are not such as to favor the growth of bacteria.

STRUCTURE OF TEETH IN RELATION TO CARIES.

A part of the argument which it is intended to present, and which is by no means new, is that the character of the tooth tissues has as much if not more to do with the production of or freedom from caries as any external local condition. I know it is argued that there is but little difference in the hardness, which we may interpret to mean power of resistance, in the teeth of different individuals; in other words, that as the chemical analysis of bone shows what is usually looked upon as a fixed proportion of organic and inorganic substances, the chemical analysis of the teeth should be of the same order. But this understanding regarding bone is largely erroneous; it is acknowledged by most medical writers, and by not a few anatomists, that many of the diseases to which bones are liable depend mainly upon the disproportion between their two constituents, organic and inorganic. Thus, "In the disease called 'rickets,' so common in the children of the poor, the bones become bent and curved, either from the superincumbent weight of the body or under the action of certain muscles. This depends upon some defect of nutrition by which bone becomes deprived of its normal proportion of earthy matter, while the animal matter is of unhealthy quality." "Osteomalacia is a disease of adults characterized by the decalcification of existing bone and by the failure in calcification of new osteoid material. In this disease the bone shows a diminution in organic and an increase in inorganic material. Senile atrophy renders bones porous and brittle, and portions of bones may be actually absorbed, as is seen in the alveoli of old age." (Da Costa.)

If, therefore, it be acknowledged that disease and degeneration of the bones are so largely influenced by a defective or a deficient constructive or sustaining process, why is it not reasonable to suppose, and in fact believe, that for the same reasons and in the same manner the proportionate amounts of organic and inorganic constituents in the hard tooth tissues might be so variable that they would be unable, under even the most favorable environments, to resist those forces which have to do with their breaking down. If there be no truth in the statement that the quality of the tooth tissue is largely responsible for the outbreak of caries, how can we account for the remarkable fact that, taking the average, there is just as much decay in clean mouths as in those uncared for by brush and powder?

DR. BLACK'S STATEMENT AS TO UNIFORM DENSITY OF THE DENTIN.

I am not one of those who believe that when a tooth has completed its growth it remains the same chemically and physically ever after. Some years ago, after many careful experiments carried on for the purpose of determining the quality of the dentin in teeth in general, Dr. Black came out with the rather astonishing statement that the dentin of all teeth is the same in hardness—or in softness, as he put it; that the specific gravity is the same in all, and that there is no difference in the density of the dentin. He did not tell us how this remarkable exactness in structure is to be found in the teeth when it is not found in connection with any other organ or structure in the body. He did not tell us why he believed that a good tooth is no better than a poor one, or why he believed that there was no choice of a filling material, claiming that any filling material that will save one tooth will under like circumstances save another equally well: except that he had arrived at these conclusions through his tests, which led him to believe that all teeth are of equal quality, that this fixed quality was present at, or shortly after, maturity, and that it did not change for better or worse with advancing years. If these theories have been generally accepted, then there is little need for any attempt on my part to continue the argument begun. I do not believe that all teeth are equally good, but instead I am convinced that some are better than others, and that certain teeth now are very much better than they previously were, and also that teeth that may now be adjudged bad were at some previous time of much better quality.

If the theory of Dr. Black be accepted, it practically excludes the possibility of dental caries taking place through systemic derangements, because his assertions make the teeth a finished product, and as such they are not subject to structural change.

It may seem that the text of this paper is not being adhered to, but by the foregoing argument it is desired to prove in a measure the theory that the conditions which make caries of the teeth possible are those which depend largely upon the character of the vital forces generally, rather than upon purely local conditions as the enthusiastic *prophylactitioner* would have it understood. If this be not true, why is it that we see such a marked change in the disposition of the teeth to decay in certain individuals? These are changes the influences controlling which may be traced to some decided difference in occupation, or to a partial loss of health, or a return to health after a prolonged illness. In reciting one or two instances which have come under my own care, I know I am but relating cases similar to some with which everyone present is more or less familiar.

CASES IN PRACTICE.

The first case is that of a young man who came to me first as a boy. His visits were regular and frequent, but during a period of about twelve years he suffered but little from caries, notwithstanding the fact that he was extremely careless regarding the cleansing of his mouth and teeth. At twenty-four pulmonary tuberculosis developed, and before his death, which occurred about two years later, practically every tooth was attacked by caries and many of them were completely destroyed. The structure of the teeth, previously good, rapidly began to degenerate, taking on a chalk-like character. Are we to believe that in this case caries was due to uncleanness of the mouth, or to systemic or vital changes? Unquestionably to the latter.

In a family of four children under my care from childhood until past maturity, the same changes cited in the foregoing case were observed. Carelessly kept mouths, with but little caries until tuberculosis appeared, when there quickly followed a structural change in the teeth, with resultant caries.

Another class of cases which we have all observed are those in which for *some* reason—and the word "some" should be emphasized in this connection—persons have suffered greatly from caries for a number of years, and then this condition is suddenly followed by a change for the better; not, however, because the tooth-brush has been brought into more active service; not because the patient is giving closer attention to the care of his mouth and teeth, but because there has been some decided alteration in the vital forces favorable to the structures of the teeth, and therefore against the production of caries. A report of one such case, from among many, will be sufficient to substantiate the assertion that a change in vocation, or in the habits of living, will, through the introduction of good influences upon the physical well-being of the individual, prevent in a measure the establishment and the material progress of caries of the teeth.

A man about thirty-four years of age had for many years suffered much from caries of the teeth. He had always led a sedentary life, being employed as a clerk in a commission house. Like the young man who, when asked how he managed under all circumstances to have his cravat so neatly tied, replied, "I spend all of my idle time in that way," so it was with this patient; he actually spent a goodly portion of his spare time in brushing and "stringing" his teeth. But with all this unusual care, which in his case almost amounted to a fad, his teeth continued to decay. About five years ago he gave up his sedentary way of living and became assistant superintendent for a suburban trolley line. This change of occupation was not forced upon him by any feelings of ill health, yet at the same time there was something wrong, as attested by his teeth. These organs, previously so delicate under the most watchful care, now show no disposition to caries, although receiving but a small proportion of the attention previously given them by their possessor.

Thus far this paper is in a sense antagonistic to the teachings and practices of Dr. D. D. Smith and other prophylactitioners. If there is any good in the treatment practiced by Dr. Smith and his supporters—and I am inclined to believe that it has its place in dental practice—the benefits derived are not the result of keeping the surfaces of the teeth clean, but rather from the structural changes which follow the regular and systematic massage which the teeth receive. By this, through the stimulation of the creative and sustaining cells, the tissues of a poor tooth may be made better than they previously were, and those of a good tooth may be made to retain that desirable quality.

CORRESPONDENCE.

THE PENDING ARMY AND NAVY DENTAL BILLS.

To the Editor of the Dental Cosmos:

Sir,—The parliamentary status of the army and navy dental bills continues unchanged from the past to the next session of the 59th Congress, and therefore either bill may be called from the House calendar and passed as a separate measure or added as an amendment to any subject of legislation to which it may be germane.

The Navy bill, H.R. 13851, provides for thirty individual dental surgeons with "the rank and compensation of acting assistant surgeon," but falls short of what was sought by the N. D. A. committee in that it fails to provide corps organization, regular rank with right to promotion and retired pay, and dental examiners to examine in dental subjects. However, this bill has had the approval of the N. D. A. committee since January 1905, as the best obtainable, and because of an understanding that the enactment of the army bill would establish a precedent for a substantially identical measure for the navy. It was also understood that the parliamentary status attained by a favorable report on H.R. 13851, with its provision for limited rank, would be advantageous in promoting Senate 3150, with its provision for regular rank.

The law under which thirty army dental surgeons are now employed was framed and promoted to its passage by the N. D. A. committee under instructions recommended by Drs. McManus, Hinman, and Noel, to wit: "In reference to the report of Drs. Donnally and Finley, we do not entirely agree with them that 'we should work for status only,' but recommend that this association work for the admission of dentists into the army and navy and then for their status." Accordingly, the passage of the contract bill, February 2, 1901, was followed at the next session of Congress by army and navy dental bills identical in their provisions for corps organization, grades of rank, and eligibility requirements, the army bill differing in that it made contract dental surgeons eligible to rank regardless of age and without tests of physical or professional fitness. The army bill was then favored by Surg.-gen. Sternberg, but vigorously and successfully opposed by Secretary Root, and thereafter was opposed by the Surgeon-general, the general staff, the chief of staff, and Secretary Taft—an array of opposing military authority against which the resources of the N. D. A. committee made slow though equal progress in Congress with the medical bill, which is advocated by all these authorities, by President Roosevelt, and by the united medical profession speaking through its national body, 38 state and 2300 county societies, and many of its colleges and individual members.

The first tangible step in the legislative progress of the pending army dental bill was when the Surgeon-general, yielding in a measure to the N. D. A.

committee, agreed to favor a bill to be drawn in accord with the views he expressed officially under date of April 15, 1904. His views, briefly stated, were—That the number of dental surgeons should not exceed thirty; that all should start with the rank of lieutenant; that all alike should be required to meet prescribed age, physical, and professional standards; that, on examination, five should be promoted to captain after five years' and three to major after fifteen years' service; and that the dental examining board should be composed of one dental surgeon selected by the Secretary of War from the contract dental surgeons and two dental surgeons nominated to the Secretary of War by the president of the American Dental Association.

No bill to exactly accord with these views was framed, but, taking these views as an only basis for a compromise, the provisions of Senate bill 2355 were favored and presented to Congress January 26, 1905, with the all-important approval of the Surgeon-general and the all but fatal renewed disapproval of the general staff and chief of staff.

The more important concessions contained in this bill which were not included in the official views of April 15, 1904, are—

(a) An increase of about 100 per cent. in the number of dental surgeons.

(b) An unprecedented exemption of *all* contract dental surgeons from an age standard universally required of commissioned officers.

(c) An unparalleled liberality in accepting, at the option of the Surgeon-general, the entrance contract physical and professional examinations instead of a re-examination on the higher standard required for commissioned rank—a concession not granted or proposed to be granted the contract surgeons.

(d) Granting mounted rank and reckoning time served in contract positions in computing longevity pay, thus at once increasing their pay from $260 to $400 per annum.

(e) Creating three captaincies instead of their being earned by five years' service, and making them eligible to majorities after ten years' instead of after fifteen years' service, and increasing the whole number of captains threefold and the majors twofold.

(f) Changing the Surgeon-general's recommendation that two examiners be "nominated to the Secretary of War by the president of the American Dental Association" to certification of their qualification by the Executive Council of the N. D. A., thus changing the "nomination" by one man to "certification of qualification" by seven men and changing the appointing power from a political to a medical officer.

With these liberal provisions—not all that were desired, though more than could reasonably be expected to escape congressmen who were prompted to give them special scrutiny—the bill passed the Senate April 23d, but with an ill-advised amendment by which it was intended to displace the board provision by one which would place an army surgeon at the head of a board to examine in practical dentistry and the subjects of a dental college course.

If this amendment should prevail against the recommendation of the Surgeon-general, the N. D. A. committee, and the Senate and House military committees, and the view expressed by the N. D. A. in 1900 on the recommendation of Drs. C. N. Johnson, Jas. McManus, and T. T. Moore, to wit: "We respectfully ask the association to carefully consider the question of the Surgeon-general's intimation that this association suggest condidates for appointment as examining dental surgeons under the proposed law, and the committee feels that the power to recommend resides with the Executive Council," it is believed by the best informed that it will create friction between medical and dental officers, give undue weight to the surgeon's estimate of the value of the dental educational course, deprive the N. D. A. of the intended recognition of its philanthropic motives in successfully promoting an army bill of humane and economic value, and, in seeking further legislation, this surgeon's views, rather than the dental surgeon's, would likely prevail with the War Department authorities. It would also deprive the Surgeon-general of the right to retain in the service, as a civilian examiner, any professionally qualified contract dental surgeon who might, through other amendments or by reason of age or physical condition, fail to secure regular rank.

On April the 28th, the House Military Committee reported favorably this bill, and recommended the adoption of amendments restoring the original board provision, limiting the number of dental surgeons to forty-five, requiring one year's probation under contract as a test of fitness for rank, and requiring that all contract dental surgeons, in order to be eligible for rank, must have been within the standard age (thirty years) at the time they entered the contract service.

These proposed amendments should not have been made the occasion for ill-considered comment, or for the use of means to restore the original provisions of the bill that would reflect on the good faith and just intent of the Military Committee or other committee or person. More objectionable provisions had been proposed, and through the quiet and orderly effort of the N. D. A. committee, withdrawn. It is true that under one of the proposed amendments, *if adopted without modification,* seven contract dental surgeons would lose their positions, but, through the immediate coöperation of members of the Military Committee, the Surgeon-general, and the N. D. A. committee, the modification of the effect of this amendment was assured within a few days after it was proposed.

In order to make sure of the retention in the service of *all* the seven over-aged without loss of pay, tenure, or prospect of more favorable legislation later, it is necessary that they and their friends should feel and show an equal interest in each of the seven (that is, for the seven as a class) and not seek a personal advantage for one over another. Under such a condition the plans of the Surgeon-general and the N. D. A. committee may be safely trusted to carry, without loss to anyone, while all that has been gained through strenuous effort for the profession and for the army and navy corps may be retained and enlarged with enduring honor and increasing benefit to the profession.

Yours faithfully,

Wms. Donnally.

Washington, D. C., September 4, 1906.

DENTINITIS FROM DIABETES.

To the Editor of the Dental Cosmos:

Sir,—Having read the letter from Dr. A. L. Betancourt on this subject in the August Cosmos, it recalled some cases that have occurred in my practice. There is no doubt in my mind that the condition which the doctor encountered is due entirely to pathological changes in the dentin brought about by a faulty or impaired metabolism.

That glycosuria is a purely nervous disease has been proved experimentally by injury to the floor of the fourth ventricle, after which free grape sugar has been found in the urine, blood, and serous fluids of the body; that this condition also follows pancreatotomy (the surgical removal of the pancreas) is a positively known pathological fact. Some authorities claim for it an origin in the pituitary body. But there has at least been established by said injury and operation a pathological condition known in general medicine as diabetes mellitus. Why, though, the resulting sugar should only be found in the blood, lymph, and serous fluids, while organs like the liver, pancreas, and spleen (which is enlarged), kidney, and heart are practically free, has never been explained satisfactorily.

These facts leave us in the dark, and we must admit with chagrin that the etiology of this disease is far from settled; but to connect this disease with dentinitis we must bring the connecting links together. In the first place we recall our first two years of college studies—taking us back to embryology and physiology, where we were confronted with the fact that the cerebro-spinal nervous system, and the cutaneous covering of the entire body, with its appendages, as hair, nails, enamel of the teeth, and the crystalline lens, are all outgrowths of the epiblast or outer embryonic epithelial layer of the blastoderm. We must not overlook the fact that the crystalline lens, cornea, nails, and dentin are named among the extra-vascular connective tissue, likewise the epidermis. Clinically diabetes sustains these facts, as it is well established that like tissues suffer similarly in certain diseases. This is shown beautifully in glycosuria, as being a purely epithelial type of disease, and with atrophic changes in the epithelial tissues the skin becomes dry and rough, the nails brittle, the hair falls, dry diabetic gangrene of the most distal extremities, as toes and fingers, occurs, also the opacity of the crystalline lens called diabetic cataract, and last, but not least, the enamel and dentin of the teeth even take on a heavier color due to the malnutrition through the dentin via the odontoblast; the last we may justly call diabetic eburnation. Now, it naturally follows that the dentin is in itself robbed of proper innervation and nutrition; this causes localized dentinitis, establishing later localized eburnation.

The consolidation or hardening of dentin is due to a continued or even increased functional activity of its trophic nerve supply, in order to maintain its normal physiological function; there are a number of facts in support of this theory. Boedecker and Heitzman's postulate on dentinitis is in my mind nothing less than a trophic disturbance of the odontoblastic lymph in the dentin, and instead of causing an inflammatory condition, it really establishes an atrophic area which in itself rarely causes any trouble. Now, as these spots become harder than the adjoining structures, it follows that they are more acute in conducting irritations. When any foreign substance, such as filling materials placed against or in its substance, seems to irritate the subjacent structures, this irritation is carried to the lymph in the remaining portion of the dentinal tubuli, which in turn irritates the dentinal nerve fibers of the odontoblastic cells. If these conditions of eburnation are diagnosed during excavation of the cavity, the proper treatment is to cut away more of the dentin, or cap it with a non-conducting substance. The etiology of diabetes is so obscure that we do not know the true causes which affect the nutrition of the skin, nails, hair, crystalline lens, teeth, etc., in this disease, as all these are under a special nerve influence (capillary, sympathetic, trophic).

By physiological experiment we learn that a man can eat several ounces of grape sugar in twenty-four hours. Sugar is then found in the urine, blood, and lymph, the same as though the man had diabetes minus the abnormal quantity of urine passed in twenty-four hours; or, in other words, this condition is due to the fact that there is not enough oxygen in the blood and tissues to permit total combustion of the extra or excessive amount of sugar ingesta.

This state of affairs can be kept up for days and weeks without any visible pathologic changes or detrimental effect on the general health of the patient, the action being merely transitory and analogous to finding albumin in the urine several hours after violent exercise, as rowing, etc. It is interesting, and requires thought as to the possible pathology of diabetes mellitus, the two statements above seeming at first glance to contradict themselves, for in the first instance we find sugar in blood, lymph, and urine, and by this we conclude that there is something in the metabolism that manufactures sugar without the taking in of sweets; in the second, we have taken more sugar in than we have oxygen in blood and tissue necessary to produce total combustion, and the sugar found in blood, lymph, etc., is only a surplus floating around in the liquid tissues of the body until it is eliminated by the kidneys.

There is no doubt in the writer's mind that in the not distant future the major portion of morbid physiology connected with the teeth, and the nerves, gums, periosteum, etc., supplying nutrition to the teeth, will be better understood, and that dental pathology and physiology will be more deeply and thoroughly studied.

We must not lose sight of the fact that the diseases of the teeth (excepting primary decay) and the connective tissues that surround them and furnish their nutrition are sequels to many general systemic diseases. This is true of stomatology in general, and it is essential to know and recognize these secondary and tertiary lesions of the mouth and teeth as well as specialists do in ophthalmology, dermatology, and neurology. Where these facts are better taught and learned, we are better able to find the cause for so many obscure aches and pains in the teeth, jaws, and face, and better able to cope with these troublesome and masked conditions and treat them scientifically. I feel sure Dr. Betancourt can conscientiously resign himself to the fact that his operation was skilfully performed, and that the disturbance which followed was due to the morbid condition superinduced by the general health of his patient.

FRED'K W. STEINBOCK, D.D.S., M.D.
PHILADELPHIA, PA.

PROCEEDINGS OF SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, March 1906.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, March 20, 1906, at the Academy of Medicine, No. 17 West Forty-third street, New York city. The president, Dr. Van Woert, occupied the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. GOLDSMITH. I want to show a little bridge in which the bicuspid stood within the arch. We did not wish to cut off the bicuspid, although we devitalized the tooth. A gold crown was made for it, but in order to have the esthetic effect of a porcelain crown the front of the gold crown was cut out and made into a box, into which was set a porcelain inlay. I do not know whether this is new, but it is so as far as I am concerned.

The paper of the evening was then read by Dr. J. WRIGHT BEACH of Buffalo, entitled "The Control of Patients," as follows:

THE CONTROL OF PATIENTS.

The subject I present for your consideration may justly be regarded as one of the fundamental problems governing the success or failure of the individual practitioner. I think you all will agree with me that the most useful and generally the most successful dentist is that one who best controls his patients and most thoroughly understands the art of receiving, treating, and dismissing them. To be sure, mechanical perfection is a necessary requisite in our work, yet without an equivalent proportion of skill and experience in the management of patients, the possessor of the highest order of technical ability will never advance beyond a mediocre stage in the practice of dentistry. It might be well at the outset to seek a comprehensive definition of the topic I have chosen, and I can think of none more applicable than that used by a town wag of my early acquaintance who, in advancing his opinion upon a leading question, remarked that it was "very simple and complicated." I believe that adequately defines the control of patients. It is as simple as A B C, and as complicated as the most knotty problem in political economy; as easy as breathing the pure morning air, and as difficult as stilling the mighty waves of the ocean. The simple aspect we may consider as involving the dentist and his environment; the complicated aspect has reference to our patients.

To render these remarks more explicit, the following classification of the various motives and incentives predominating in our patients may be of assistance. If one desire to enter more deeply into the study of this simple classification and work out its almost illimitable combinations, as in the study of psychology, physiognomy, etc., it would entail a great amount of work and study which would avail but little, and be of less practical use, perhaps, than the simple one I present.

PATIENTS AFFECTED WITH FEAR.

First in frequency and importance is that bane of dentistry, FEAR, which may be subdivided as *hereditary* or *acquired,* *actual* or *imaginary, mental* or *animal.* Every dentist in active practice is through stress of circumstances constantly on guard against this our common enemy. In fact, are not we ourselves continually in fear of fear?—fearful lest we fail to allay it and equally so lest we unwittingly provoke it; fearful also that the patient may discern our fear and thus defeat our efforts. Does not this condition reveal a secret cause for the nervous dentist? Close application and difficult operations are but factors in the agency which undermines the dentist's nerve force; it is, as well, the nerve tension, ever present, which is induced by secret fear—or apprehension, if you wish—that in time snaps the vital strands. Analyze this condition within yourself and tell me if this be not true. Yet, is not this innate constituent, peculiar to our profession, absolutely essential to real success? To reach the highest plane of professional excellence the dentist must possess, to some extent, a fear of fear to temper his treatment of the fearful. It begets sympathy, caution, and consideration—three cardinal virtues of the dentist. The fear of pain may be characterized as a mental condition largely dependent upon association, and may not be attributed to the operation in hand so frequently as to those which have gone before, the recollection of which vividly remains. Our task involves the control of a mental state induced by previous conditions, the degree of which must first be ascertained and classified in accordance with each individual case.

Hereditary fear is transmitted by the parent, and although infrequently met, does exist, and is most difficult to overcome. The unfortunates deserve all our sympathy, and should be treated with utmost consideration. They are characterized by a furtive, appealing manner, apparent in every movement, and acute mental stress indicating severe mental anguish. The intensity of their mental suffering cannot be realized by others, and the treatment most efficient may be almost any means to induce mental and physical relaxation.

Acquired fear is the most common class with which the dentist comes in contact, and is generally caused by indiscreet persons magnifying the trials of the dental chair in the presence of those who have never had any dental experience. The greatest injury these reprehensible persons cause is, of course, among the young, whose impressionable minds are ever ready to absorb that which will prove most detrimental to their future welfare. Infinite harm has been done by these horror-mongers, and they constitute a serious handicap to our efforts to educate the public to a just appreciation of the motives of our profession. Except in extreme cases it is not especially difficult to control this condition and to allay the fear by establishing confidence and dispelling the unsavory illusions.

Actual fear may, in a measure, be compared with hereditary fear, yet it is not necessarily a part thereof. Actual fear refers to that which really exists—in which imagination plays no part. Patients of this class are not uncommon, and usually recognize the condition in themselves and by well-directed effort endeavor to overcome it. The treatment is made much easier because of the co-operation of the patient thus affected.

Imaginary fear is more taxing upon the dentist than the patient. It is a highly wrought mental state over which little or no attempt at control is exercised, and requires but a small amount of fuel to feed its flame. It is an unstable quality, and the operator must ever be on his guard against fresh outbreaks. We do not find this condition obtaining among our most intellectual clients, for there is usually an admixture of animal fear with it. The credulous and suspicious usually belong to this class. They have formed an odious mental picture, and labor under a conception of imaginary pain. Firmness, precision, dissuasion, and mental preponderance must be exercised to gain ascendancy, and when once in control no great difficulty is experienced in retaining it.

Mental fear may be termed an attribute of the mind. It might be designated as intellectual fear, and is found in highly organized persons of the mental or nervous temperament. The control of this condition largely depends upon the ability of the operator to recognize it, together with the combinations which may exist, the element of imagination being frequently associated with this division. In treating such cases, endeavor to meet the patient upon the same mental or intellectual plane, which position when duly recognized and appreciated materially aids in securing control.

Animal fear is most exasperating to the dentist, and he should not be subjected to criticism if he retained his sympathy for a more deserving class. Intelligence and the finer sentiments do not enter into the composition of those belonging to this division, hence such treatment as would apply to those already mentioned could not be successfully employed. We find an almost bestial state existing, and figuratively speaking, the rod must rule. Argument and persuasion are entirely fruitless, and consideration by the dentist is useless. Proceed without reference to the patient, and render your service for humanity's sake. Your reward must come from doing your professional duty, and not through appreciation of your efforts by the patient.

I will next take up the classification of patients with reference to the predominating characteristics exhibited by each class. Although it may appear somewhat ambiguous, I submit it for your consideration in the hope that it will assist in giving my ideas a more tangible form.

The *timid* patient may be in some instances actuated by fear, but more frequently the timidity is due to a retiring nature. Such persons may become ideal patients under proper influence and direction. Confidence and harmonious relations must be established, harshness avoided, and patience exercised. There are few conditions more favorable to being molded into a most desirable state to the dentist. They are well worth cultivation.

The *indifferent* patient manifests little interest in the style or quality of your work or the manner in which it is done, and as a rule is highly unsatisfactory to treat. This apparent indifference may prove but a mask, however, and your illusion may be summarily dispelled when least expected. It is safest to look upon this state with more or less suspicion, and keep the guard well up.

The *self-confident* patient may also be regarded with some degree of apprehension. He walks to the chair with a reliance which, to the uninitiated, is very gratifying, and the novice is deceived by the confidence manifested. So long as everything goes smoothly all is well, but when the self-complaisance is shattered, it is unusually difficult to restore it. Such patients become really afraid, and the dentist's guard should never be relaxed.

The *loquacious* patient upon first introduction usually enjoys entertaining the dentist with a history of each tooth, present and past, or introduces some other time-consuming topic to the extreme discomfort of the listener. Should you prove an apparently willing audience, it is probable that the appreciation of the patient will be manifested by telling you of all your good qualities and his high opinion of your abilities. Should you fail to impress him favorably he might show the unreliable quality in his make-up by talking as strongly on the opposite side, and even become abusive under some conditions. "Discretion is the better part of valor" when dealing with such persons, and it behooves the dentist to use few words, well freighted with meaning. This type is not always unreliable, yet a goodly percentage will prove so.

The *parsimonious* patient belongs to an exceedingly undesirable type. His one object is to get value received and as much more as possible. It is practically impossible to satisfy them in this respect, and they are almost invariably ungrateful for whatever is done for them. These conditions foster a suspicion which carries them far beyond the state of being desirable clients. To satisfy them one must be unethical, for no self-respecting dentist can drop to the level of commercialism which they occupy, and therefore firm adherence to principle is our only safeguard with this class of patients.

The *antagonistic* patient applies to those unfortunate individuals who naturally antagonize everything and everybody, always having a different method to suggest from the one you recommend, with seldom a good reason to substantiate it. They form a most exasperating type for the dentist to treat; however, when we have properly placed them and realize their natural infirmity, their control is not especially difficult, and this characteristic should never be taken seriously. If it be an acquired or assumed state, when they discover that it has no effect upon the dentist, it will not be of long duration. Not infrequently they show a resentful inclination, which quality no operator can permit, and when the combative element is added, they become positively insufferable. To use a common expression, they "always carry a chip on the shoulder." In treating this class, who usually lack breeding and are often ignorant, the dentist must rise above himself and temper his actions with charity and compassion. It may seem hard to do so at times, but one feels better for it. When we battle with the same weapons used by the enemy we must stand on the same level, whether it be elevating or the reverse. Raise them to your level, if possible, and the problem solves itself.

OTHER KINDS OF PATIENTS.

The *inconsistent* patient is not a rare species, and is exceedingly trying to a nervous dentist. It is well to bear in mind that good sound argument and common sense are entirely lost on such patients. After the dentist has exhausted his stock of reason and explanation, he finds them advancing the same inconsistencies as before. Then he mentally kicks himself and applies a few expletives under his breath, after which he is ready to begin aright and make only such statements as he deems proper. A good, sound "calling down" is often very effective, but should never be attempted unless justified by existing conditions. Persons showing this proclivity are naturally more or less unreasonable—in fact, are but an aggravated exemplification of the condition just described. They are argumentative, and will not be convinced under any circumstances. When this trait is discerned, the lesson that it imparts leads us to avoid the use of unnecessary words. If this condition is further developed, we find ourselves in contact with the prejudiced patient, and when the bias is pronounced, the sooner you indicate in a gentlemanly and positive manner that they may "take it or leave it," the better it will be for all persons concerned. Not infrequently you will be surprised at finding yourself the victor.

The *nervous* patient is perhaps the most common type of all. The term as used by many of our clients is capable of very elastic interpretation, and is a cloak to cover a multitude of dental ills. Imagination is often at the bottom of the so-called "nervous" state. The discerning dentist quickly places the patient in the proper category of nervous manifestations, and as speedily formulates his procedure. It may be the use of sedatives or obtundents; it may be a soothing manner; it may be mental diversion or physical relaxation, or it may be just simple "jollying." Whatever the means employed, he will proceed with extreme caution, slowly feeling his way. It is judicious to impress the idea that you know just what you are doing. The actually nervous patient has become so thorough a physical degenerate that he has not sufficient resistance to control the shattered nervous system. These patients should receive our best efforts toward relief, and are deserving of great consideration. It is not strange that they develop impatience while under the dentist's care and thus make treatment more difficult. We can, however, put up with nervousness and impatience until they become fretful, which rounds out a trio of conditions of the most exasperating kind. With all the drilling and schooling our nerves receive they are not proof against a combination such as this situation presents.

The *obstinate* patient may be placed in a class by himself. He is "pig-headed," and resists all pacific overtures the dentist may advance, and can be neither coaxed nor coerced. He is "mulish" and obdurate, possessing some of the characteristics of those controlled by animal fear, yet the management must be radically different.

There is also a state which might be designated as "social nervousness," which is really a very trying kind of this mental malady to treat. It is occasioned by too many parties, late hours, and after-theater dinners. It is not a difficult condition to recognize, the patients apparently being troubled by "that tired feeling," listlessness, and all the symptoms indicating an acute mental irritation. They are living under high pressure, and always have their eyes open to see just what you are going to do and what instrument you are going to use. They may be said to belong to the class known to all of us as "jerky" patients. Whenever a sensitive point is approached the head is jerked away with astonishing suddenness, which the dentist is unable to follow. The "jerkers" do not all belong to this class, however, but may be found among those belonging to that extremely nervous and imaginative type of patients who also give vent to their feelings by grasping the operator's coat sleeve, thus interfering with his work. These actions are very displeasing to the dentist, and must be overcome by demanding a display of self-control on the part of these patients, for we find them endowed with sufficient intelligence and mental force to render them susceptible to moral suasion. In young patients who show this trait, good American spunk is apt to be an accompaniment. In treating the adult of this class, positiveness and decision must characterize our dealings. With the child it is even more essential to employ this method, and when there is an admixture of spunk it is well to ask the parent to remain at home or go for a walk, while you "have it out" with the youngster. If the will is broken, you will have added one more to your list of good patients; if not, it is well to let some other dentist try. There are, however, modifications of this type which may be brought into line by persuasion; but the patient really typical of this class will hardly be controlled by less drastic measures.

The *ideal patient* may be said to combine, in proper proportions, all the qualities named thus far, and I do not doubt that each of you can cite many among your *clientèle* who exemplify this ideal. Susceptible persons may be developed into this desirable state, hence it is well to have an ideal toward which to work. I believe it to be as essential to adopt this course in relation to our patients as it is in all other departments of dental practice.

THE DENTIST HIMSELF.

Following the classification of our patients, the next phase of the subject in relation to importance that might be considered is the dentist himself. In his hands rests the most potent means of control of the patient, and failure is often due to his inability to grasp and apply this idea. This requisite quality of the dentist may be termed the "mastery of manner," which may be defined as that quality of conduct in our relations to our patients that brings to us their confidence and esteem. When we go farther, and try to say in what this conduct consists, we are brought to a sudden halt. There is a subtle, elusive something about the possessor of this quality that is hard to define, yet it is constantly felt when in his presence. We might almost term it hypnotic suggestion. At any rate, it is the ability of the dentist to instantly grasp and comprehend the individual characteristics of each patient under treatment, and to as quickly accommodate himself to those conditions.

Ask the busy dentist how he receives and treats his patients, and you are likely to find him unable to answer further than by giving a few set rules, which apply as well to the barber or chiropodist as to the dentist. He does not know himself, because it is that subtle, indefinable something which, through constant daily application, has become a part of himself. He does not receive two patients in the same manner; he is guarded, yet frank; sympathetic, yet firm; ever retaining mastery of the situation without asserting too strongly his own personality. He insinuates himself, as it were, into the confidence of his patient, without fully comprehending just how it is done. When receiving a new patient the brain of the adroit dentist is undergoing mental gyrations and evolutions—in the popular vernacular, he is "sizing the patient up"; forming mental defences which render him able to gain and soon to control the mental forces of his client.

All the elements of success do not lie in skilful work or office furnishings. Most important is the power to control the patient without his actually realizing it. First impressions are of utmost significance, and we should never receive new patients without being properly prepared and so situated that the advantage is always in our favor. In other words, meet them for the first time in the operating room, preferably after they have been seated in the chair. It is well to let them sit for a brief space and become somewhat familiar with their surroundings. The lady assistant may adjust the towel and look to their comfort, and when the stage is properly set the luminary may appear upon the scene. Thus you have scored a point, and the patient is in the subjective. This method need not obtain in every instance, in fact might not meet with favor in many cases; however, it is well to avoid meeting patients in the reception room; that is set aside for their use, and not for the dentist's during office hours.

It is a grave misfortune for the dentist to think that his *clientèle* are interested in his family, social, or business affairs, and that it is his duty to properly enlighten each one therein. Neither is it good taste to conduct a lengthy dissertation upon dental topics unless requested to do so by the listener, and when so requested the explanation may be couched in simple, concise language, avoiding scientific terms which the patient does not understand. Nor will the same manner, conversation, or language apply to every case. It is much easier to talk oneself out of than talk oneself into the confidence of patients. They apply to the professional man to receive and pay for his services—not to have him waste their time in a display of oratorical pyrotechnics. The people demand up-to-date dentistry. We have led them to believe that we have advanced to a wonderful degree of perfection, and they have the right to expect quick, time-saving results obtained with comparative ease and little or no pain.

The dentist who is a living exponent of "fads and fancies" in his practice must eventually come to grief. Hobby-riding is all very well, and may delude a certain class of patients into the belief that the dentist is thoroughly up-to-date and really progressive; however, the most desirable class will soon get tired of being the "dog," and will give him an opportunity to try his fads on some other unsuspecting victim. Strange as it may appear, Dr. Fad does not understand why Mrs. Jones has sought other fields, for he conscientiously tried every new means to save her teeth. The moral to be gleaned is to employ reasonable conservatism in the selection of new methods and to avoid unnecessary exploitation of them to the patient.

It has ever been a rule with me in practice to permit no patient who has a regular appointment to leave without having accomplished something tangible. It requires, for many, much fortitude to visit the dentist, and they usually feel a keen disappointment if no progress has been made. This also applies to business men, whose time is often much more valuable than our own.

To antagonize the patient's ideas or opinions may prove disastrous. Not infrequently do they make suggestions which may be followed with profit. Experience bears me out in the statement that it is best to allow the patient with "ideas" to express them in his own way. There are times when it behooves one to be a good listener. It is well to receive the suggestions and gratify them by appearing duly thankful, and then—do as you may see fit. By permitting the strong-minded patients to believe that their suggestions are timely and good the dentist may, by adroit mental manipulation, practically reverse their opinion without their realizing the change. Had these views been antagonized at the outset, no quarter would have been given. I do not view this procedure in the light of deception, but rather as a means to an end which is justifiable.

We might recommend that all dentists be of a bright, cheerful, and joyous disposition, and although our daily surroundings may not be entirely conducive to such a condition, it is our duty to strive toward that happy state. If we have not been bequeathed this priceless fortune, perhaps we are justified in substituting that purely American commodity commonly dubbed "jolly." In the inelegant and somewhat slangy language of that great philosopher, "Josh Wise," "Many men like to be jollied some of the time, but all the women like to be jollied all the time." However well that statement may apply to general business, it is not, in the abstract, suited to our use except when meted out in doses to suit an individual case, adhering closely to the homeopathic plan at all times. When it is ill-timed and ill-starred, there is nothing that makes us feel more keenly how dismal the failure has been.

This protracted exploitation of the topic might be materially curtailed by recommending some of the cardinal virtues for application in daily practice, the principal of which is charity. It solves many unpleasant problems, and places the dentist in a receptive and responsive mood, which usually engenders a like spirit and assures co-operation.

There are times when the dentist is more irritable than at others. He finds himself disagreeing with many of his patients, perhaps over trivial matters. When the opening of the reception door occasions a feeling of dread, with a continual hope that appointments will fail, it is a positive diagnostic sign that such irritability exists, and the cure is—a vacation.

CONTROL OF CHILDREN.

A most important phase of this subject is the control of children. One might consume an evening in treating of the many and varied points in connection with our little patients. First in consequence is the application of an invariable rule: Never deceive. Avoid subterfuge, and use strategy only when necessary. Primarily, we must mentally "place" the child as we would the adult. Then place ourselves in a proper mental position. Take on, for the time, a child's mentality governed by a man's judgment. But be an *older* child than the patient, and treat them as of equal age. Nothing so flatters the child as to be thought as old in behavior and manner as a big sister or brother. A responsive chord has been touched, immediately placing them on their mettle, and I have seen many remarkable exhibitions of fortitude when thus appealed to.

The parent often is responsible for the child's fear of the dentist. The idea of fear and pain should never be suggested to children; this unfortunately often is done by some interested person who has very considerately endeavored to prepare the impressionable mind, that the horrors of the dental chair may not be unexpected. What infinite harm has been done in this way! How vast the field for dental enlightenment! The plastic mind has been poisoned by "error," and the arch-enemy of "Christian science" has usurped the God-given state in which we were alike created. If first impressions are significant in our intercourse with elders, are they not of vastly greater import in connection with the young? We should at once endeavor to please them with our personality, then acquaint them with their surroundings, and impress them with the idea that they are going to have a most delightful time. Bribing children is a most deplorable practice, and should be resorted to as a last expedient. When they are about to leave, it is a good idea to present them with some trifle as a reward of merit, but not of hire. Dispelling the remembrance of pain caused by the wanton extraction of a tooth is one of the most difficult feats of mental manipulation we are called upon to perform. Not infrequently it is absolutely impossible to do so, and we are obliged to labor under a perpetual handicap which time alone can assuage. When coaxing and other legitimate means of persuasion fail, it is then that the rod must rule, and the dentist must be permitted by the parent to put into force whatever radical means his judgment may indicate. Vacillation is disastrous, and firmness tempered by kindness must be in command. We ought ever to bear in mind that the little patient may be the big one some day, and it behooves us to so prepare him that he will be not only a source of satisfaction to the tutor and to the tutored, but to our fellow practitioners if perchance he should apply to them for treatment.

HYPNOTISM—MENTAL SCIENCE—"CHRISTIAN SCIENCE," ETC.

Another phase in the control of patients seems worthy of at least passing notice, viz, hypnotism, mental science, and "Christian science." The first is exercised by the will of the operator, the second by the will of the patient, and the last by the will of the Almighty. That inherent quality of the individual which gives the power to so attract the patient that he will submit to an operation which at the hands of another would be more trying and perhaps more painful, has been designated "hypnotic suggestion." Whether it be that, or some psychologic intercourse, or a confidence born of a mutual responsive interchange matters little, but that such a state does exist every dentist will acknowledge. The same dentist gains and retains patients when this quality is established, and fails to acquire and retain others when it is absent. The status of hypnotism in relation to dentistry has not been fully determined up to this time. It savors too much of empiricism and quackery to be seriously considered by the ethical element of the profession. The fact that sleep is induced by the will of the operator upon susceptible persons, and leaves them under the entire control of the hypnotist, at once places it beyond the field of usefulness except by a few specialists. The element of danger attendant upon its full employment also renders it more or less hazardous. It appears to me that the phrase "hypnotic suggestion" is hardly applicable to the influence which the dentist exerts over the patient to accomplish the work as desired. It is rather due to personal influence which may come through the exercise of the mental powers assisted by willingness of the subject to be influenced; a surrender to your will which places you in the ascendancy. It is extremely doubtful if hypnotism or hypnotic suggestion will ever prove of importance in the control of patients.

Mental science, in the broadest sense, may be termed the power of the mind over the body. Its advocates believe the force of the principle to be greater than that of any other which seeks the control of the mental faculties. As dentists we cannot gainsay the fact that we may derive much practical benefit from a demonstration of this science by the patient. It is a quality of mental reliance superinduced by the cultivation of the inherent forces of the mind, governed by intelligence. By bringing this mental state to bear upon the conditions attending dental operations, the patient can be of material aid. To what extent these benefits may accrue to us, remains for the future to evolve; however, it is a matter of discretion that we lend encouragement to those who endeavor to put this principle into force. It is in contra-distinction to hypnotism as well as Christian science, the believer relying upon the will power or inherent forces without the element of divine intervention. I have not come in contact with many of this persuasion, and am not sufficiently conversant with its precepts to speak authoritatively, yet I feel that its merits are worthy our consideration in so far as they assist us in our daily work.

Christian science appeals to a more exalted psychic plane. The scientist is prompted by a superior mental incentive, and endeavors to overcome evil conditions through the medium of spiritual manifestations, and is diametrically opposed to those just mentioned. *Fear* is the paramount "error" in Christian science, the subjugation or dissipation of which constitutes the great battle they are continually waging. Fear is also the chief enemy of the dentist, the dispersion of which means everything to our profession. It seems to me that we should encourage this great principle which advances us toward the millennium of dentistry. Real "scientists" do not contend that they can overcome the pain from sensitive dentin, but by dispelling fear they eliminate the chief element. There is no doubt as to the efficacy of the principle when applied to dental operations, and it should not signify a lack of sympathy on the part of the operator if he endeavors to instill the force of the idea into the minds of his patients. Those who scoff at Christian science do so through a lack of understanding. One cannot become a scientist without first placing oneself in a proper mental state to imbibe the great underlying principle upon which it is founded. That such principle does exist can only be determined by intelligent study and investigation. I am not a Christian scientist and do not comprehend its teachings, yet through my intercourse with patients of this belief I am convinced that it is founded upon the rock of truth, and its application to dentistry will give more satisfactory results both to patient and operator than all the modern appliances and so-called painless methods which have been evolved by our profession up to the present time. Keen-edged instruments; positive yet careful manipulation; fear and dread reduced to a minimum through the establishment of a right mental state, however accomplished, will prove, I believe, for all time the best legitimate means for controlling the peculiar pain which the dentist must daily combat. Fortifying the patient by all the art of control which the dentist possesses, using sympathy when indicated, and leading up to a state of mental reliance, will materially assist in creating the ideal patient—so dear to the dentist's heart.

Discussion.

Dr. OTTOLENGUI. The essayist said that the control of the patient is both simple and complicated. I should say after hearing the paper that it is only complicated. I have been looking over the list of patients that he has posted up, and I find I have not so many kinds. I have a few timid people; and I have been working lately for an indifferent man who goes to sleep every time he is in the chair. The self-confident kind—I am not sure whether I have one of those or not, but the mother and sister of one patient are so self-confident that they tell me what to do every time they come.

I have a loquacious child, and she is the most lovable thing that comes to my office. She was timid, too; but as the essayist said, you can work on timid patients and make them satisfactory. This youngster is about five or six years old, and very pretty. Her mother brought her along one day under a false pretense, saying she was going to take her somewhere else. When she first came to me she stamped her foot and said: "I hate it! I hate it! I hate it!" I will not tell you what I did for her, but I got through with her the other day. She was so pretty that I took her in to see an artist who has a studio in my building. I sent her back to my office and stayed to talk with the artist, and when she got back to the office she said to my assistant, "I have to wait for the doctor to come back and tell me whether that artist wants to paint me or not; and then I have to look in that appointment book, for I am sure I must come again." I had told her there was nothing more to do, and my nurse said to her, "There is nothing more to do for you; your teeth are all filled." Then she said, "Don't you think he could fill one of the teeth over again?" I could, because it was only filled with gutta-percha, but I did not think it was necessary.

I have no unreliable or abusive patients, because I would not work for them more than once. I think we should do our duty to people, but we need not work for unreliable or abusive ones.

I have one parsimonious patient, and I have lots of fun with him. I sent him a bill, and he took off the odd dollars and sent me a check for the even. The next time I sent him a bill for $34, and he sent me a check for $30. I never send that fellow a receipt, but I send him a note saying "Your check for $30 received, for which accept thanks." He thinks he is in that much, but he is not, for I am sending bills now for even money and he does not discount it.

An ungrateful patient I would not work for a second time—if I found it out.

As to suspicious people, I think we should allay their suspicions. Antagonistic and combative people do not get into my office at all. Inconsistent and prejudiced people come to me from other dentists. [Laughter.] I am having more trouble with people who have been "prophylaxisted" than anything else. They think I do not clean their teeth right, but I have a grand answer for that: I tell them I do not make a specialty of that; that they should go to someone who does.

The essayist has given us a list of troublesome people, but he has left out a lot of nice patients—courageous patients, for example. I have a little one who had a deciduous tooth that was bothering her, and it was about to be shed. I said "Girlie, that will have to come out, but it does not need to come out today. We can take it out next time." She said, "Well, I don't know as it will hurt any less next time!"

I take a great interest in the little patients. If you win their good-will they will be loyal to you. The older they are the more suspicious they are; but children can be managed by a very simple proposition: just treat them as little men and little women, and appeal to their courage. You will be astonished to find how much courage they have.

I want to say just a word about hypnotism, mental science, and Christian science. I do not agree with the essayist on the differentiation. He said hypnotism is a power exerted by the practitioner; mental science is an attitude of the patient, and Christian science is help from the Almighty. I am going to recommend to all who are here—especially the younger men—a book called "The Influence of the Mind on the Body." The author is Dr. Hack Tuke, and the American edition is published by the J. B. Lippincott Co. The author was a very celebrated alienist in England. As far as I have been able to discover, it is the only medical scientific work on the subject extant. It is divided into three parts, I believe; first, the influence of the mind on the nervous system; second, the influence of the mind upon the organs of the body, and finally the influence of the mind upon the arterial system. He has investigated the alleged phenomena of hypnotism in its various forms, and the phases of Christian science, and compares them to the practice of medicine men of different wild tribes in Africa and different tribes of Indians, etc. He reduces this all to regular system and order, and shows quite clearly the secret of the whole thing—that there is a distinct influence of the mind over every part of the body; and an expert in the knowledge of those facts can play upon the various organs of the body through the mind of the patient. There is nothing I ever read that has given me as much help in the management of patients as that book. I have read it at least eight or nine times all through, and very much oftener gone over different parts to refresh my mind.

You will find that hypnotism and mental science and Christian science are all one thing—only different phases of one truth. Suggestion is the fundamental principle. For example, you might resent the idea that by suggestion you could be made to do something you did not want to do; but the suggestion is operative best when you do not know it is being made. If you hear a certain cry in the street and see a tremendous crowd rushing, perhaps before you know what you are doing you are half-way across the street. Suggestion—other people running across the street to find out what is the matter—leads you to do the same thing. Dr. Tuke tells you how to scientifically apply suggestion.

To go back to the self-confident people I spoke of: The child is of an age where she could be made to do almost anything. I know the history of the family, and she is going to be molded into something very unpleasant. Her sister, a married woman, has been coming with her, and I finally said, "You must either keep still when you come with this child, or she must come with a maid." She said, "What do you mean?" I said, "You are antagonizing everything I do for that child." She said, "You do not know what is good for her." I answered, "I may not know what is good for her at your house, but I know what is good for her here in my office." Then the mother came, and she was worse. She said, "You cannot dictate to me what to say to this child." I said, "No, but I can tell you to take her to another dentist." That is a condition of affairs that I meet many times. The essayist has touched on it. It is interference in your work by outsiders, and the mother is just as much an outsider in such a case as anyone else. I can do much more with children if they come with a maid, not someone on whom they feel they can lean for sympathy.

There is another aspect of this paper that I want to call your attention to, and it is this: It has been said that dentistry was all written out; yet here is a subject that is of vital importance and interest to us all, and this is the first time I ever heard a paper on the subject.

Dr. Gillett. I think the paper is very interesting and very timely. We are considering many new aspects of our work in these days, and together with the increasing interest in the management of our practices in a systematic manner in other lines. I am interested to see this feature brought out. It is a fact well recognized by all of us that many very successful practices are made so for other reasons than the professional ability of the operator. What we call tact, and what Dr. Perry in one of his classical papers has called the personal equation, are equally and sometimes more important than the operative capacity of the man who conducts the practice. I feel that good will necessarily come to all of us, and particularly to the younger men, if we can make a systematic study of this phase of dental practice.

I will now relate what seems to me a unique case that came to my knowledge—that of the wife of a physician who has the capacity of hypnotizing herself in the dental chair. She accomplishes it without any assistance and did it in the beginning without even the knowledge of the operator. She is described as being exceedingly sensitive, with excruciatingly tender teeth. During an operation she suddenly—to the astonishment of the operator—apparently ceased to suffer, and seemed to be wandering off into some happy state which he did not understand, and which alarmed him very much. She repeats this at will while undergoing operations. I think this an interesting case in connection with the point of view the essayist has stated concerning hypnotism.

Dr. Goldsmith. Without going into any lengthy discussion, after commending the essayist for having brought this matter before us, I want to express a thought upon the subject of hypnotism. I published some years ago, in the *International Dental Journal*, the case of a patient whom I had hypnotized and carried to the third degree of hypnotism, the complete loss of sensation, at my will. I have not tried hypnotism—that is, the complete third stage of hypnotism—for many years, principally because I am afraid. We do not know what hypnotism is. I do not know what molecular or cellular change may be taking place in the cortex or any other part of the brain, and I have been fearful lest some pathological change might ensue. It might, too, place undue power in the hands of immoral persons—people who ought not to exist in any profession, but we hear that they do—and I have been fearful lest we have too big a stick to wield. I confess that the element of fear has been very great, or I might have used it more.

Dr. Ottolengui says this book explains the different relationship between the three degrees of hypnotism and of the power of the mind over the body of the patient. They are very much alike. My reading has been more along the line of investigation of Professor Bernheim of Nancy, France. I should be very glad if this matter could be brought before us, because I think the power is a great one. The question is, How great is that power, and what changes does it produce?

Dr. FERRIS. I wish to thank Dr. Beach for his paper of this evening. I concur most heartily with his technique and will be glad to put his suggestions into practice. I would like to add a method which has been of some value to me in unruly cases; that is, the control of the irritation produced upon the optic, the auditory, and the olfactory nerves of hyperesthetic patients. Under ordinary conditions my window shade would be up, and the cuspidor running, and there would be the ordinary moving about the office. For a patient of that nervous type I cut out as much light as possible, stop the noise of the cuspidor, and burn a pastil before the patient comes into the room. By carrying out this simple arrangement I have been able to handle a number of very highly sensitive patients with a great deal of satisfaction. I think that the irritation to the nervous system in general, through these particular senses, is worthy of consideration.

Dr. BEACH. Dr. Ottolengui has done me the honor to say this is the only paper ever written upon this subject. I might say that it is almost as new to me as it is to any of you. I have not delved into the subject, but it appealed to me, as putting the question before you in a little different light than ordinarily presented, that we might all get some suggestions which would promote discussion. The management of our patients is certainly of vital interest, and there were some suggestions offered which I shall try to follow out myself.

Dr. Ottolengui in his remarks, it seems to me, emphasized the personal equation of which Dr. Gillett spoke as having been touched on by Dr. Perry. I think Dr. Patterson also wrote on that subject, or somewhat along that line. It shows the personal equation far in excess in Dr. Ottolengui; he has the ability of controlling his patients, and that probably has induced or produced the indifferent person he speaks of—the patient who goes to sleep in the chair. I have had some myself who went to sleep in the chair, but I was able to wake them up very quickly. We will have to attribute the success he has to his own personality rather than to any method or external power.

In regard to the book which he has spoken of, I shall try to get it myself, as I am interested along that line. Bringing the matter up in this way, and designating certain topics or headings gives us some tangible form to work on. It is not intended that those presented represent all patients, but I believe each one of us has patients who represent to a certain extent the great majority of those conditions. I have chosen the conditions which are perhaps hardest to antagonize or combat, for the reason that those are the ones that are most interesting. The patients that are easiest to control are not the only ones we want to have under our care.

I thank you for your attention, and regret that I could not give you something better.

Dr. TRACY. I move a hearty vote of thanks to Dr. Beach for this splendid paper.

The motion was carried unanimously.

Adjournment.

Monthly Meeting, April 1906.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, April 17, 1906, at the Academy of Medicine, No. 17 West Forty-third st., New York city. The president, Dr. Van Woert, occupied the chair and called the meeting to order.

The first order of business was

Incidents of Office Practice.

Dr. J. F. P. Hodson. It is the small things in operating that are ofttimes of the most practical value to us, and I have lately come upon one that has done me so much good that I offer it to you to-night. A very offensive thing to me is to see in the mouth the dirty brown color that gold showing through the enamel produces. It is almost worse than to see the gold frankly sticking out beyond the tooth in the front of the mouth—a condition which has always been my especial horror, although I am quite willing to admit in this that the exigencies of individual cases make it sometimes imperative even with an artist. I have always endeavored to obviate this by lining the cavity with something that will reproduce the natural color of the tooth. I formerly used goldbeater's skin, but that is a very recalcitrant material for this particular use. It is stiff and most difficult to retain in position unless gummed or cemented and then the moisture of the gumming will make it creep all over the place, but it does give a beautiful color and one that nothing else will give so well. Moreover, it is very tough and it is practically impossible to cut it or tear it off just inside the cavity margin after it is in position. It must be shaped and fitted wholly before placing it. I have about given that up of late, and having long ago discarded all the varnishes—as in my experience they invariably oxidized and discolored far more than they ever decolored—I have used oxyphosphates instead.

Now, in order to place a thin layer of oxyphosphate on the inside of a cavity whose surface is more or less irregular, one is liable to get it too thick in some places and too thin in others, and if one attempt to trim the cement to an even layer afterward, it is almost impossible to avoid either cutting the layer through or chipping it away entirely in places, and so again uncovering the cavity wall. I have hit upon the idea of applying a blanketed squeeze to the oxyphosphate layer by putting a creamy mixing of quick-setting cement of the proper color on the inside of the side wall—one side is often all that is needed—and very quickly putting a blanket of gold foil, preferably No. 4 or 6 unannealed, folded upon itself two or three times so that it may blanket the cement absolutely; then taking pellets of cotton of different sized masses and pressing the gold foil with the cement ahead of it strongly against the cavity wall or walls. While the cavity is packed full of the cotton I take a flat burnisher and go around just inside of the edge and make sure that no cement is left there. Taking away the cotton there remains an ideal condition of the cavity. The shape is not at all changed for the holding of the completed filling, and the natural color is restored to the tooth through an evenly spread thin varnish of the oxyphosphate which covers every inequality of the dentin and enamel walls and is placed there under pressure. The effect in the finished operation and through a large surface of translucent enamel is exceedingly artistic. As mentioned, I prefer the several layers of unannealed gold to a single one of corresponding aggregate thickness, because the latter might tear through and spoil the whole scheme, while several layers of the non-cohesive foil sliding upon each other will wholly prevent its doing so.

With quick-setting oxyphosphate one can proceed at once with the gold filling, but if it be desired to wait till another sitting an additional layer or so of gold may be added and the cavity filled with gutta-percha, the extra layer of gold being but to furnish something for the gutta-percha to stick to and pull away, thus leaving intact the lining proper. In lining for color in the case of amalgam fillings I should use tin foil to blanket with, and never gold, as I have found that gold foil so placed under amalgam discolored the tooth afterward, even to blackness.

Dr. H. W. Gillett. I have recently found an additional use for the absorbent paper canal points Dr. Hodson suggested many years ago. They are more effective than broaches in pumping chloro-percha into large and medium-sized canals.

Dr. Hodson. I have for a long time gotten over that trouble, and with much ease, by using the principle of capillary attraction. I cover a smooth fine broach with a thin coating of chloro-percha, place it in the root-canal, carrying it home exactly and positively to the apical end, to which I want the chloro-percha finally to go, leaving it there, and then touching it at the orifice of the canal with a drop or two of milky chloro-percha. It will follow the broach wherever it has been coated with chloro-percha. Then I just twist the broach around two or three times to make sure that the dryness of the evaporated chloro-percha has not stopped it. I make sure that the canal is lined with chloro-percha without an air-space and to the extreme point. Then, following that—I do not *fill* canals with chloro-percha; the procedure described is only to fill the interstices not possible to eliminate with the hard smooth points—I heat the plugger and just touch its extreme end to the cold gutta-percha point, and so carry it quickly through the chloro-percha snugly to place, and so I am sure that I have gotten to the end of that root-canal.

The paper of the evening, entitled "Correcting Dental Irregularities by the Jackson System" (illustrated with charts and models), was then read by Dr. V. H. Jackson of New York city.

[This paper is printed in full at page 1085 of the present issue of the Cosmos.]

After reading his paper, Dr. Jackson made some additional remarks, as follows:

Dr. Jackson. Sometimes I call this system the "Arm and Finger System." We have a body, with arms and fingers with which we grasp things and move them from us or toward us. We become very expert in the manipulation of the fingers and arms, almost invariably accomplishing the movement we desire.

Appliances made after my system usually have a large base-wire—the body. From this body metal arms and fingers are extended for expanding or contracting the arch and moving the individual teeth. Keeping this analogy in mind assists one in designing the regulating apparatus, and also in shaping the springs in order to obtain the desired force. For expanding the arch laterally, the arms of the apparatus are bent outward by the hands, or by means of flat-nosed pliers, first making a tracing of the appliance as previously described, to insure the exact distance of the movement.

With these appliances we have under perfect control the expansion of the upper or lower arch on one or both sides, or the movement of one or more of the teeth. For expanding the lower arch, the base-wire can be bent where it enters the center of the anchorage portion—or what I sometimes term the "wrist joint"—so that it will expand the anterior part of the arch alone. By bending outward the arm portion of the appliance without changing it at the wrist joint, the whole side of the arch may be forced outward, or by changing it at the wrist joint one part of the arch may be drawn inward and the other outward, namely, inward at the region of the molars and outward at the region of the bicuspids and canines. Springs of any shape can be extended from the anchorage portion.

For equalizing the upper and lower arches with the apparatus shown, I advise that a collar with a short lug on the disto-buccal surface be cemented to the last molar on each side of the arch for supporting the end of the wire clasp. This makes the anchorage absolutely secure, which is an essential requirement if the teeth are not well erupted. It also insures the apparatus from becoming loosened should the patient remain away —and I often allow an interval of four or six weeks between visits.

As I have stated, the appliance can be readily removed by the patient for cleansing by first pressing backward the end of the wire clasp with the thumb to disengage it from the lug.

The harder the rubber equalizing bands draw on the hooks of the wire clasps, the more thoroughly the clasps will clinch under the lugs.

In the upper arch, when the teeth protrude extensively, there is usually no condition demanding the use of any anchorage other than the regular one, but if the angle of protrusion of the front teeth is such as to permit the semicircular spring that passes in front of the incisors to slip down, from the force of the equalizing bands, the spring can be retained by cementing to each of the lateral incisors a collar provided with a slight lug on the labial side. If there are spaces between the incisors they should be closed by the action of the spring, after which the force should be relieved to prevent crimping of the teeth. This is done by soldering a piece of plate metal across each of the U-shaped loops to prevent further action of the spring.

If I may be pardoned, I should like to re-quote the following from the paper that I read before this society nineteen years ago, as showing that I was thinking of correct occlusion in those days: "The method that will cause the least injury to the teeth and surrounding structures, interfere least with articulation [occlusion], and move the teeth to the position desired in the shortest time, should be adopted."

The matter of correct occlusion is not a new subject, as is known to all students of the older literature. We have been studying this matter for years. When we articulated artificial teeth we made them so that they would occlude well. What is the correction of irregularity, and what is the meaning of the term orthodontia, if not the placing of teeth in correct occlusion? I see no reason for speaking of correct occlusion of the teeth as something new.

Discussion.

Dr. J. Lowe Young. I am very much pleased with Dr. Jackson's paper for various reasons, one being that when going over his book to ascertain his manner of rotating teeth, I found that he advocated in quite a number of cases the extraction of teeth, and I am glad he has not spoken tonight of extraction to correct malocclusion. I am glad to find that he has not shown any models where he extracted to correct malocclusion. The correction of malocclusion is an utter impossibility where a tooth has been extracted anterior to the third molars; that I think is beyond question. To have occlusion, all the teeth that God Almighty intended man to have should be present, for when even one has been extracted a correct occlusion cannot be re-established.

Dr. Jackson just at the close of his paper spoke about there being nothing new in occlusion. Most assuredly there is nothing new in occlusion; there has always been occlusion, but there is something new in the fact that some men in this country recognize that the teeth must be in proper relation in opposing jaws. That is the new thought in this work.

I would like to ask Dr. Jackson how often he thinks it is advisable to use a chin-cap. It does not seem to me that cases where a chin-cap is of any advantage are frequently encountered.

He speaks of constant pressure, and I agree with him most thoroughly on that point. The way to place teeth in their proper positions with as little pain as possible is by means of constant pressure, and I therefore like to employ appliances that I know the patient is not wearing in his or her pocket most of the time.

Another point I heartily agree with, but I want to go a little farther than the writer did, and that is the early intervention in malocclusion. That has been one of the great drawbacks to the science of orthodontia—this idea of waiting until all the permanent teeth excepting the third molars are in place before attempting to correct the deformity. I believe this is a great mistake. If you observe carefully, you will find that at four or five years of age you can very often tell without a shadow of doubt that you will have malocclusion, and if you know it at that age, why not take steps to prevent it? It is better to have the teeth erupt in their proper positions than to push, pull, or shove them into position after they have taken an abnormal one. You ask, How can we tell? We all know that the deciduous teeth—that is, the six anterior teeth—are very much narrower than the permanent teeth which will replace them. At three years a child should have all its deciduous teeth, and the approximal surfaces should be in contact with each other. If a child is developing normally, it will at four and a half or five years have spaces between the lower incisors, then the laterals, etc. If there be no space there will not be room for the four permanent incisors in that arch, and there will be malocclusion. If you start then to get the space it is quite probable that your incisors will erupt in their normal position. A little stimulation at that age simply in the lower arch will widen both the lower and the upper, if the upper teeth have well-defined cusps and lap over the lower.

There is one more thing I wish to speak about. Dr. Jackson says we usually find the arches wide enough in the region of the first molar. There is a difference of opinion on that point. It is safe to say that ninety per cent. of the cases are not wide enough in the region of the first molar. I think the cases are rare where you do not require widening in that region to properly correct a case of malocclusion.

Dr. Jackson apologizes for his models, and says he did not have time to make up nice models. I was early taught that if a thing was worth doing at all, it was worth doing well; and I believe that applies to models in orthodontia as well as to anything else. If a man is going to do orthodontia, he should have a good guide to start with. If men would do that and have good models, it is an incentive for them to do good work all the way through.

Dr. Ottolengui. I want to take exception to one thing in the paper, and I am going to ask Dr. Jackson as a favor to eliminate it if possible from his paper. Dr. Jackson has alluded to the elastic extended from the upper to the lower jaw as an equalizing band. It has been, not only in orthodontia, but in every branch of dentistry, a detriment to scientific progress that every man who has become in any way prominent has preferred his own terms to the terms already in existence. I had a lady come to me once and ask me if I could tell what was the matter with her teeth. I examined them, and said "pyorrhea." She said, "One minute, please." She took out a notebook and said, "Yes, I have had that once before." She had kept a list of the names given to the disease by different gentlemen in Europe and America, and she had more than a dozen names, and yet she only had one disease. Now, that is not scientific.

The same is true of the term "Baker anchorage." Such terms are unscientific; they do not express the facts. It is wrong to call this a Baker "anchorage," because it is not always an anchorage; and it is wrong to call it an equalizing band, because it is not always an equalizing band—in fact, it is less that than anything else for which it can be used.

Why not call it what it is—intermaxillary force? You may use that force for any purpose, and it is always intermaxillary force, but it is not always an equalizing band; it might be used so that one jaw would remain entirely stationary and one tooth in the other jaw would be moved, in which case one end of it would be an anchorage.

At the present time I am using it in rather an odd way. After aligning the teeth in two jaws, I have met this peculiar condition of affairs, that the lower jaw was in distal occlusion on one side and mesial occlusion on the other. The intermaxillary force is being used in opposite directions. It extends from the upper to the lower jaw on one side, and from the lower to the upper on the other, thus pulling one arch to the right and the other to the left. It is never an equalizing band, but it is always intermaxillary force.

Now, just a word about having time to make models. If one becomes so awfully busy that he has not the time to do it, there are many people who can be hired for a small salary who will do it and who could be taught to make beautiful models for six or seven dollars a week. While

I do not by any means make beautiful models, I make better ones than I did; moreover, it does not take me as long as formerly. Here comes in a factor that was trained into me by my long association with Dr. Kingsley, and I give it to you as a valuable thought: Do not think of all your work at once, but just of the stage you are doing. If you do that well, you are in a position to do the next step well, and the next, and so on.

I will conclude with just a few words on occlusion. Dr. Jackson quoted from a paper of nineteen years ago as an evidence of the fact that he was working along occlusal lines in orthodontia at that time. The doctor quoted, "The method that will cause the least pain and inconvenience to the patient, the least injury to the teeth, and interfere least with articulation, etc." You will all admit that the old idea was that teeth which interdigitated correctly were in occlusion. This language—although perhaps Dr. Jackson did not mean it that way—conveys the idea to straighten as few teeth as possible and interfere as little as possible with interdigitating teeth. Imagine the back teeth in the upper jaw slightly tipping lingually, and the teeth in the lower jaw tipping lingually to meet them; imagine them perfectly interdigitated. In former days those teeth would have been left alone because they were in occlusion. We realize now that they are not in occlusion, but must be moved—that they are in malocclusion; that is the main difference between the old and new ideas of occlusion.

Dr. J. N. Farrar. I have been much interested in Dr. Jackson's paper and his way of making springs. He has covered considerable ground. In this discussion some of the speakers touched upon antagonism and occlusion, and as they sometimes call it, articulation, etc. Those three terms I will not dwell upon, although there may be a great deal to be said about them. Those terms do not mean the same as here asserted. Articulation is a term commonly used for joining bones together in the skeleton, also for distinct utterance of speech. Occlusion is the act of bringing the jaws nearly together, as in speech or singing, but it does not mean antagonism. Antagonism is the bringing of the *teeth* together, as in the act of mastication of food. I trust you can see the difference.

The subject of this evening seems to be springs *versus* screws, but principally springs. As the speaker has mainly dwelt upon wire springs, I suppose I ought to talk about them. In the early part of his paper he says that screws cause hypertrophy; yet springs do not cause hypertrophy. I have been regulating teeth forty-three years, and I have used springs and screws and all kinds of continued and intermittent force, and feel that I am an old hand at it. In all that time I have yet to see the first case of hypertrophy resulting from the use of screws. I have seen traction bands bunch up the soft septum tissues between teeth—but that is not hypertrophy, and I have seen springs do the same. Both will do that if used too rapidly, but bunching will pass away in a few days by absorption. Will springs act properly under all circumstances? That depends very much on how they are used. If moderately, carefully, and skilfully used the teeth can be moved without much pain, if the patient is not nervously constituted. If we use screw force, give the key to the patient, and say, "Turn the screw just enough to feel slight pressure but no pain," they will never come back and say it hurts, and the teeth will have gone along in proportion to the advance of the screw. When we use springs we are not quite so sure. It is not possible to always get the right tension of a spring in the case of a sensitive patient.

I am not talking against springs, but the use of springs under all circumstances. I have seen teeth pulled every way, and the patients said it did not hurt at all. There is a class of "thoroughbred" patients whom I will not now indicate, that we can do almost anything with, and not hurt them; but when we come to the mixed races, we are dealing with (as Spencer says) "a disturbed equilibrium." If we regulate teeth for that class, we must work carefully and make all the progress we can before the ambition for regulation breaks down.

When a person applies, I size up the would-be patient in regard to that point. First I determine whether or not he or she is nervously constituted. Is he or she attending school continuously, and studying hard? Is she, or he, a person confined to the house a great deal, with sedentary habits, etc.? All these conditions must be taken into account. A girl at school, about sixteen or seventeen, is not physiologically in the best condition to have the teeth regulated, while a boy is different.

I will skip over the question of infantile regulation; it is too big a subject to discuss at this time. When a girl about fifteen or sixteen years comes to me, I say to the parents, "Undertake this operation before she gets to be seventeen years of age if you can, especially if she is intending to go to school." I am now treating a case of upper teeth, and I have asked the parents to suspend the operation just at this time. We have regulated all the teeth except the centrals, which I wish to draw in by the skull-cap process. It does not please a girl to make her wear such a thing in school, so I advise the parents to let the patient stay at home. If they say it will interfere with her studies, I say, "Those studies can be taken up at any time, but the regulation cannot. It is a question with you to decide whether you want the regulation properly completed, or whether the going to school is more important."

Gentlemen, you all know that the education of young ladies is being rushed altogether too much at the present time. It is better for them to rest for a year now and then than to injure their health. So it is with some boys whose natural intellectual development is too rapid. Some persons say it sets the child back. Well, I would rather see a robust child than a poor feeble anemic creature.

Now, upon the question of screws *versus* springs I have written too much to need to go into that question now. While I have used springs in all ways many times, I have almost universally used screws for the last twenty years, and anyone who has seen my operations in process knows well the results.

Dr. Jackson has made an excellent presentation of his side. The instruments he uses are admirably adapted to certain movements. I would not use them at the present time, however, because I think I can do operations in a better way. But his are excellently constructed, and in most cases I think that they will work well. There are, however, many fine points that are necessary in order to bring out the beauty of the face, which he has not touched upon at all.

Dr. E. A. BOGUE. I do not care to speak if the subject and the paper are entirely on the Jackson appliance. If it is on orthodontia I should really be glad if I might be permitted to ask Dr. Jackson a few questions; but before doing so, I want to make him my compliments for the ingenuity he has shown in devising apparatus for moving teeth. I want to offer him my personal thanks for his entire disinterestedness and kindness in showing not only his appliance, but his method of making the same, to his professional friends. Having done that, I should like to know if I am permitted to ask him questions in regard to orthodontia—not necessarily in regard to his paper this evening.

Dr. JACKSON. Anything.

Dr. BOGUE. Then I should like to know if in undertaking a case of orthodontia, Dr. Jackson is aiming at normality, and whether normality is the best condition of things, or not.

Dr. JACKSON. I do not understand how anyone can be a specialist of orthodontia without aiming toward the best; in other words he must adopt an ideal. His ideal may not be the ideal of his neighbor. He is not a good orthodontist unless his ideal is higher than the average, and he should endeavor to accomplish work according to his ideal—which should be, always to bring about the best result for the patient, I might say regardless of what the other man thinks. The question is whether that would be "normality." It might not be aiming toward normality, because a decided hereditary malformation which it would be undesirable to encourage might be normal for that patient. The man who is not well balanced and has not an ideal would not be able to deal best with that case, because he would be running into difficulties. I have at least two cases now in which men had been aiming at what might be termed normality, where the results were unsatisfactory. Perhaps I have not fully answered the doctor's question.

Dr. BOGUE. I do not understand Dr. Jackson's underlying thought. So I will ask again, Is the normal man the most perfect man, not only about teeth, but about anything?

Dr. JACKSON. I feel I have answered that question. Is it fair for me to ask Dr. Bogue what he means by normality?

Dr. BOGUE. Either this discussion is along scientific lines or it is not. If it is, my question, whether answered now or later on, is a proper question. Normality is the best condition into which man can get. It is the best of everything. The splendid athlete is looked upon as a normal man. It is also perfectly true that in civilized communities the normal dental armamentarium is not often found. A friend, whom most of you know—Dr. Anema—sent me a postal just as he was leaving London, in which he said he had succeeded in finding in the London museums just one normal occlusion.

Dr. OTTOLENGUI. Did he look at the whole of London?

Dr. BOGUE. He looked at the museums and found just one skull that he considered normal. You know he is a pretty careful man. I spent one week, a year ago last March, in the National Museum at Washington, and I found a good many that seemed to me normal. Dr. Jackson quoted from his workings as far back as 1887. We have learned a good deal since then, and very little that was done at that time is worth quoting now. Appliances are mere tools, and the man who does not understand how to use them may have the best of tools and yet not be able to produce the best results.

Dr. Young said we always had what he calls occlusion. I think he meant articulation, for occlusion means to close up tightly. It is as near an occlusion as teeth can come. Yes, we have had that since man lived on the globe, but we did not understand it. The first comprehensive paper was by Dr. I. B. Davenport of Paris, published in 1887—the discussion of what is today called normal occlusion. I happen to know about it, because I read the paper at this very society when I was president of it. That was the first accurate pronouncement of occlusion, and the knowledge of that has since been disseminated pretty widely. Dr. Jackson says it was his incentive; so it was to Dr. Angle, who got his first clear ideas on occlusion from it. On top of that, the old idea which Dr. Bonwill brought up before he died, of measuring teeth and arranging them in the proper arches for artificial work, has been very accurately and correctly applied by Dr. Hawley to the natural teeth, and it is always a correct guide to working. Therefore that is what I should call normal articulation or occlusion, and the question in my mind was whether that was what Dr. Jackson aimed at. He has described nicely his appliance, but he did not mention the principles which underlie his work. It is quite possible to lay down on paper the work we want to do in regulating teeth, and work up to it, the same as an architect works up to his plans in the building of a house, and if we do that we do not make false steps and have to go back and retrace them.

The next question I was hoping for an answer on, is—What is occlusion? But as it would take perhaps a little longer than is worth while, I will not say anything; but I give notice that I meant to ask it in order to awaken the thought in those who are interested in the question, that they may answer it for themselves.

Dr. JACKSON. I want to say that I am pleased with the kind reception of my paper. I came here this evening to show improved methods of expanding the arch and moving teeth, etc. If I have given some ideas that will help anyone to get better results, I feel that I have fulfilled my mission. I sometimes call this the humanitarian method, as when properly handled no pain or discomfort is produced.

As to the matter of extraction and occlusion: I want to say that I never extract a tooth without studying the conditions seriously and doing what I consider best for the patient. My business is saving teeth. I went to a dental college to learn how to do so; the necessity and means for saving teeth are what is generally taught in those institutions. I have never extracted a tooth that I thought should be saved; if there be no crown on the tooth I try to save the root.

I want to express my obligations to Drs. Farrar and Kingsley for the many things that I have learned from their writings. I followed them closely and owe much to them. I want to say that through their writings I was led into orthodontia.

This evening I have shown the method I think the most simple, the easiest to apply and the most comfortable for the patient. The appliance is removable and can be taken out by the patient for cleansing.

As to the age for regulation, the youngest case I have corrected is two years and ten months. Dr. Ottolengui showed the models to a society some years ago. I speak more especially of cases ranging from six to seven years, and from that upward to any age. I would like to ask Dr. Young how he moves teeth for children four years old—whether he uses the expansion bar.

Dr. Young. At that age I would not think of putting on the expansion arch at all, but merely a small wire placed from canine to canine in the lower arch. That can be done by drilling little pits in the canines, or putting little bands on them, soldering a soft German-silver wire to one of them, and have it fit into a short tube on the opposing canine, and then with the pliers made by the S. S. White Co. known as "regulating pliers" it can be pinched once a week, or once in two weeks, as you see fit. It will stretch and lengthen it, and in that way widen out the arch.

Dr. Jackson. Dr. Young describes how he increases the distance between the deciduous canines by extending the ends of a wire into holes drilled into them. I have never practiced it. Expanding the lower arch often expands the upper arch through occlusion, but the lateral expansion of the arch is of no benefit unless the canines are moved outward also. Increasing the distance between the deciduous canines does not always expand the arch back of them, but pressure against all of the deciduous teeth—not only the canines—will expand the arch with the true bone of the jaw if the movement be sufficiently slow.

Dr. Young. If the lower deciduous canines are expanded you will expand the entire arch—first molars and all—without anything else on; I know that to be so.

Dr. Jackson. In the child the alveolar process is thin, and there being so much of softer matter as compared with the amount of bone, there generally is not enough stability to the process to cause the outward movement of the whole lateral sides of the arch when force is applied simply to the canines.

As to Dr. Ottolengui's exception to the terms "equalizing the jaws" and "equalizing bands," is it not a matter of opinion? Those terms seem most appropriate to me. When Dr. Ottolengui made use of the expression "jumping the bite," was it proper?

Dr. Ottolengui. No.

Dr. Jackson. You equalize them. Where the one arch seemed twisted, you wanted to twist it backward—that is, move the teeth forward on one side of the arch and backward on the other. I want to show you how I move the whole arch of teeth in that manner with my system.

Now let me go back just a moment. I stated that when the distal part of the arch is as broad as it should be, locate the palatal base-wire back where the arch is broad enough as shown by this chart. I have not said that all arches are broad enough in the region of the first and second permanent molars, because we are all the while expanding such arches. When the distal part of the arch is broad enough we apply force for expanding the anterior part by removing the appliance and pressing outwardly on the arms sufficiently to bend the base-wire a little and readjust it, doing this at intervals, as I have stated, of about once a week.

Now, when we want to move the teeth forward in the line of the arch on one side and backward in the line of the arch on the opposite side, as in the case Dr. Ottolengui referred to, we take the apparatus, such as I show here, and warp it a little at a time—that is, take hold of the anchorage portion on each side of the appliance and force forward on one side and backward on the other, bending the base-wire a little so that the appliance will press the teeth forward on one side and the teeth of the opposite side backward, always doing it scientifically by first making a pencil tracing on paper of the appliance, in the manner I have previously described. This force of the apparatus in connection with properly attached rubber equalizing bands readily brings about a correct occlusion.

Dr. Bogue has been interested in orthodontia for years. I met him when I first came to New York. He is still putting questions to me. We both have high ideals, but do not always agree. Dr. Bogue believes in keeping all teeth in all cases. He once showed me models of a case in which I favored extraction. I was sincere in that and wanted to help him. I have always wanted—although I never told the doctor this—to see the result in that particular case, because I imagine if he did not extract, that the placing of the teeth in line would cause such an extreme prominence that the features would not be attractive.

Many of the cases of prominent jaws and prominent noses that we see are what might be termed normal. They may never have had any interference from the orthodontist or orthopedist. We sympathize with them, and wonder why these prominences exist. It may be normal to them, but as orthodontists we do not approve of these prominences, and it is our business to deal with and correct them. That is why in my book I speak of harmonizing the features when there is a prominent nose. Every orthodontist should know about facial orthopedia. We should straighten out those prominences as best we can. We must try to improve on nature.

Dr. Ottolengui stated that I was not the author of the rubber equalizing bands. I never claimed to be, and I do not know who was the author. I used them for a case in 1889. It would be interesting if Dr. Farrar would tell us if he knew of rubber bands being attached to the upper and lower arches years ago. They did not accomplish as much with them as we do now, but they used to get desperate and resort to all sorts of appliances. Perhaps Dr. Perry can tell us something about it. Rubber bands and ligatures were then used in many ways that are not generally remembered now.

Dr. OTTOLENGUI. Tell us exactly what you did with that case in 1889, when you used the elastics from one jaw to another.

Dr. JACKSON. I refer to that case in my book. I was using the "crib" method of regulating at that time, which was entirely different from my present system. It consisted of wire. The wire crossed the labio-buccal surface of the teeth near the gum, to the distal molars, it passed around them and extended forward, crossing the lingual surfaces of the teeth. The wire passing on the labial and lingual sides was connected by short pieces of wire extending over the arch at the junction of some of the teeth to strengthen the anchorage. In the case mentioned I stretched rubber ligatures from the apparatus in the lower arch to that of the upper.

Dr. OTTOLENGUI. All I want to know is exactly what you did with those rubbers. You tell me you used it many years ago, and it was old then. Did you pull the lower jaw forward and the upper jaw back?

Dr. JACKSON. I used it in a case of prognathism. In order that there shall be no misunderstanding regarding the term prognathism: True prognathism is double protrusion. Prognathism as referred to by orthodontists means undue prominence of the lower jaw. I think Dr. Farrar speaks of it in that way, and does not think of prominence of the upper jaw.

Dr. FARRAR. You are correct in that.

Dr. JACKSON. I attached the rubber bands to the appliance in the lower arch near the canines, and to the appliance in the upper arch near the distal molars. The result was not satisfactory, as I could not get sufficient force with the anchorage.

Dr. PERRY. How much did it draw back the lower jaw?

Dr. JACKSON. I state in my book that the result with the rubber ligatures was not satisfactory, and I adopted the chin-cap. I applied that for forcing inward the lower jaw. To the chin-cap was attached a device for forcing inward the lower teeth. I got a very good result indeed for such an extreme case of prognathism, the lower teeth being moved inward nearly the width of the first permanent molar on each side of the arch.

Dr. W. W. WALKER. Mr. President, I move you that we give Dr. Jackson a very hearty vote of thanks, one that will be spread in full on the minutes, for giving us this very able paper.

The motion was carried.

Adjournment.

WM. B. DUNNING, D.D.S.,
Editor N. Y. Odont. Soc.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-eighth Annual Meeting.

(Continued from page 1012.)

FIRST DAY—*Afternoon Session.*
(Continued.)

THE next order of business was the reading of the Correspondent's Report, by Dr. ELLISON HILLYER, Brooklyn, N. Y., as follows:

CORRESPONDENT'S REPORT.

One year ago we had the pleasure of listening to a most interesting paper by Dr. Buckley of Chicago, and during his clinic of viewing his chemical experiments bearing upon the subject of the paper. This paper and clinic dealt with the treatment of putrescent pulps. In order to thoroughly test the efficacy of this advised treatment, by a unanimous vote of the society your Correspondent was instructed to make its consideration the subject of his year's work and report.

In accordance with this expressed wish of the society, and after correspondence with Dr. Buckley, in order to act in harmony with the original intention of the author of the treatment, the following communication and blank clinical report were sent to every member of the State Society in June 1905:

June 25, 1905.

Dear Doctor,—At our last meeting a most valuable paper was read by Dr. J. P. Buckley of Chicago, entitled "The Chemistry of Pulp-Decomposition with Reference to the Discoloration Problem; and a Rational Method of Treating These Conditions." Those who heard the paper and discussion, and who met Dr. Buckley during his subsequent clinic upon the subject felt deeply grateful to him for what he had presented. To express this appreciation, as well as to thoroughly test the efficacy of his mode of treatment, it was upon motion made the subject of your Correspondent's work for the coming year. In accordance with the above, and for the purpose of a faithful report at our next meeting, I am outlining Dr. Buckley's treatment with the request that each member make *at least one test case as soon as possible;* notify me by the accompanying slip; keep careful record of such case during the coming season, and when called upon on March 15, 1906, for a report, be ready to send the same for transmission to the Correspondent's report. By this means we hope not only to derive much benefit from each other, but be in a position to present to Dr. Buckley clinical data which will be of value to him.

Primarily, I advise everyone to read these articles by Dr. Buckley, published in the *Dental Review,* viz: "A Rational Treatment for Putrescent Pulps," December 1904, p. 1193; "The Treatment of Alveolar Abscess," January 1905, p. 8. These articles cover the subject which Dr. Buckley presented in succinct form before our State Society meeting.

Briefly, the treatment suggested for your trial is comprehended in this excerpt from the *Dental Review*:

"In treating putrescent pulps we should ever have three factors in mind, viz: First, *establish asepsis;* second, *prevent recurring sepsis,* and third, *preserve the color of the tooth,* or, *if lost, restore it.*

"In establishing asepsis we should select and use remedies which will chemically change the end-products (infectious material) with the least inconvenience to our patients and to ourselves. This can be accomplished by adjusting the rubber dam, sterilizing the teeth included, and then, with a large round bur, open into the pulp-chamber, mechanically removing the débris, but making no attempt to remove the contents of the canals. Now, *hermetically* seal into the pulp-chamber, on a very small pledget of cotton, the following remedy:

℞—Tricresol,
Formalini, āā f℥j. M.
Sig.—As directed.

"I prefer to seal with a quick-setting cement, thus being certain that the remedy is hermetically sealed and avoiding pressure. This treatment can remain until you desire to have the patient return for a subsequent sitting. It can be changed the following day, or it can remain a week or more. At the second sitting, the dam being adjusted, the dressing can be removed, the canals thoroughly cleaned and dried with alcohol, after which the remedy can be placed in each canal on cotton and the cavity again hermetically sealed. It is well to allow this dressing to remain for at least three days, by which time it will have sterilized the entire tubular structure of the dentin, thus establishing asepsis. All that is necessary to prevent recurring sepsis is to thoroughly fill the canals."

* * * * *

"Undoubtedly, like myself at first, some of my readers may hesitate to hermetically seal a cavity in a tooth which contains a putrescent pulp. The reason this could not be done in the past by the methods in vogue is that we were applying drugs empirically. From sad past experience we knew that some kind of gases were evolved, which, if confined by hermetically sealing the cavity, would cause the tooth to ache and if the filling was not punctured by the dentist or patient an abscess would develop.

"The treatment which I have here outlined is a rational one, for this remedy chemically converts the irritating gases and poisonous ptomains into non-irritating and non-poisonous *liquids* and *solids.* Not only this; if I have been correct in my chemical deductions, these liquids and solids are themselves antiseptic and germicidal in character."

Kindly give this matter your immediate attention and as soon as possible send me the inclosed blank filled out as desired.

Respectfully yours,
Ellison Hillyer, D.D.S.,
Correspondent.

Clinic Report.

1. Case. [*Name by initials; state tooth and its condition.*]
....
2. Date of initial operation................
3. Notes of especial interest...............
....
....

[4 and 5 to be filled in by Correspondent on March 15, 1906, upon receipt of final report.]

4. Date of final examination...............
5. Notes of interest between Nos. 2 and 4....
....
....
[Sig.].........................
....

Kindly fill in Nos. 1, 2, and 3 and forward as soon as possible for filing to
Dr. Ellison Hillyer,
472 Greene ave., Brooklyn.

In October 1905 similar documents were sent to the secretary of each district society, with a request to bring the matter before the next meeting, to ask the co-operation of any member—whether or not a member of the State Society—and to furnish blanks to anyone desirous of complying with the request.

In all, eleven replies were received, and I take this means of thanking the writers for their interest and co-operation. I am thus explicit in my report as to responses that my successors in office may beware of unanimously voted investigations backed up by almost unanimous lack of support. However, the result is perhaps as satisfactory as if a large number had replied, in which case it would have been impracticable to have included all cases, as it has been possible to do in the present report.

CASES REPORTED.

(1) Dr. E. A. Smith, Rome:

"R. T." June 1, 1905. Child, twelve years old; lower right first molar; putrescent pulp; pain excruciating; swelling had started; pain was relieved in fifteen minutes; filled after two treatments, on June 9, 1905.

Final report, March 26, 1906: Case has given no trouble whatever since the treatment was first applied; it is in perfect condition.

(2) Dr. Morton Van Loan, Albany:

"A. C." August 21, 1905. Upper right first molar; fistula on palatal root; not aching; primary cavity; pulp-chamber opened in removing débris; treated as directed for first stage. August 30, roots were dressed as directed for second stage. September 5, roots and crown filled; no aching or soreness in the least from start to finish; fistula disappeared.

Final report, March 27, 1906: Tooth has been in a perfectly healthy condition, giving no trouble whatever.

I have used the preparation hundreds of times since, to the exclusion of every other similar remedy, and have had good results in every case.

(3) Dr. W. J. Le Suer, Oneonta:

"Miss C." September 21, 1905. Upper left first molar; buccal cavity; putrescent pulp; aching and sore. This case was a typical one for the treatment, being in a most foul condition, accompanied by considerable peridental inflammation; would not have dared to have sealed the canals under any other treatment.

Final report, April 1, 1906: Saw the case yesterday; patient reports that she detects no difference between that tooth and the neighboring ones.

I use the treatment in nearly all such cases and with uniform success.

(4) Dr. F. L. Fossume, New York:

"L. M." October 26, 1905. Have by this method successfully treated five teeth for this patient. Lower left second molar carried a gold crown, which I removed; found extensive caries underneath, and the pulp in a putrescent condition.

Final report, March 26, 1906: No pericemental infection or congestion had occurred, and all the teeth are now in a healthy condition.

(5) Dr. L. A. Timerman, Fort Plain:

"Miss I." August 5, 1905. Lower left first molar. Débris removed from canals by using formaldehyd, full strength, sealed as directed. August 18, dressing removed and tooth filled permanently.

Final report, March 28, 1906: Tooth has given no trouble since it was filled.

(6) Dr. A. H. Merritt, New York:

"A. H. M." June 22, 1905. Upper right canine; blind abscess. This case is one in my own mouth, and has caused me considerable discomfort since November 1904.

Final report, April 9, 1906: Tooth remained reasonably comfortable for three months, when it again became so painful as to require reopening. It was again treated by this procedure, but has never been free from a mild form of chronic pericementitis. This treatment was carried on by Dr. W. S. Waterbury.

For more than a year I have employed this form of treatment continuously in my own practice, but without success. By that I mean that I do not believe my percentage of successes to have been greater than those obtained by me in the use of sodium dioxid and hydrogen dioxid, following the technique outlined by Dr. M. L. Rhein.

(7) Dr. John I. Hart, New York:

"Mrs. J. S. M." July 3, 1905. Upper left first bicuspid. The soft tissues much swollen over the root and surrounding area. Opened pulp-chamber, which was found putrescent; treated as directed for first stage. July 5, treated root-canals as directed. July 7, repeated treatment. July 12, all symptoms had subsided; filled canals completely.

Final report, April 11, 1906: Perfect satisfaction.

Have used Dr. Buckley's technique in all cases of putrescent pulps that have presented, and have had most satisfactory results.

(8) Dr. B. C. Nash, New York:

"Miss A." July 5, 1905. Upper left second bicuspid. Renewed cement in a mesial cavity filled eight years previously at a time when no indications of troublesome after-effects could be detected. Three days later a blind abscess appeared. Drilled through filling, opened the root-canal, dressed it with tricresol and formalin on cotton, and sealed it with gutta-percha. July 7, applied rubber dam and filled canal with the same preparation incorporated with mummifying paste and filled partially with gutta-percha (ordinarily I would have left it open for drainage).

Final report, March 21, 1906: No development has occurred to require renewing the treatment then performed.

(9) Dr. F. W. Low, Buffalo:

"Miss E. M." July 6, 1905. Lower left first molar with caries undermining an approximal amalgam filling; pulp putrescent; tissue in pulp-canals sensitive. Tooth has been grumbling lately. Treating as directed for first stage. No pain between first and second sittings. July 7, removed cement and extirpated pulp from all three canals without pain; filled canals with gutta-percha cones dipped in Oxpara cream; filled pulp-chamber with cement and crown with amalgam.

Final report, March 29, 1906: Tooth has given no trouble whatever.

(10) Dr. F. C. Walker, Brooklyn:

My trials of Dr. Buckley's method and formula have been so irregular and so varied in results that I can make no detailed statement regarding them.

(11) Dr. H. P. Gould, Brooklyn:

"Miss L." First treatment September 29, 1905. Upper right second bicuspid. October 3, roots filled with zinc oxychlorid; root-canal had remained open for three years previous, at which time the dressing was removed, as it had caused a swelling of the soft tissues. A fistula was present, but no pain.

Final report, March 20, 1906: Patient reports a slight discharge through small fistula.

* * * * *

Your Correspondent has personally given every test thought advisable, with almost no record of failure. One case, however, appears to me worthy of instance, and I trust may elicit more definite information regarding the treatment:

A patient complained of severe pain upon the left side of the face. Upon examination no cavity or suspicious cause could be discovered nor did any one of the teeth respond to the usual tests for pathological conditions. As the trouble persisted, the lower first molar was opened through a disto-occlusal filling and the tooth was treated and filled according to this method. Still the trouble persisted, and the upper second molar was opened, with the same disclosure. This tooth is the one to which I particularly desire to call your attention. I followed exactly the treatment advised by Dr. Buckley, removing all the coronal portion of the pulp and leaving the remnants in the root-canals. That night the patient telephoned saying that the pain was unbearable, and in order to relieve him it was necessary to remove the dressing and wait for the next sitting. This was delayed by the patient having been called out of town. While away, simple cotton dressings with a trace of oil of cloves were introduced by the patient himself. On his return the roots were thoroughly cleaned, the tricresol dressing introduced, and after three days the tooth was filled with perfectly satisfactory results.

My query is this: *What guide have we as to the amount of the medicament necessary to overcome the putrescent condition?*

In the first treatment it evidently was not sufficient. In the second it was. When this has been proved by experience it seems to be easily conceded that the treatment is an eminently satisfactory one, with little but the personal equation to consider in accounting for failures.

Respectfully yours,
Ellison Hillyer.

Discussion.

Dr. Nelson T. Shields, New York. As you have heard, the report deals with a number of experiments with this application, all of which, with the exception of the case reported by Dr. Merritt, were apparently successful. It seems that this tooth had been treated uninterruptedly for a period of two or three months. After treating a tooth by chemical means for so long a time, if it still remains uncomfortable, I would suggest to let the chemicals alone and to clean out the tooth thoroughly by mechanical means, to ascertain whether thorough cleanliness and thorough filling would not remedy the trouble. I have obtained satisfactory results by opening teeth containing septic pulps, applying a small pellet of cotton saturated with the cresol, and sealing it in the tooth with cement; perhaps not touching that tooth again for a period of two or three months, devoting myself during that time to other teeth requiring immediate attention. I recall one case in particular that I now have under treatment in which this plan was followed, the tooth having remained undisturbed for two months. The patient was in my office yesterday with this treatment in the tooth, and I expect it to remain comfortable until I see him again, two weeks hence. In that respect tricresol is the most satisfactory agent, for no other could I apply with the same assurance of complete absence of after-effects. I have had a great many successes with it, and now I will relate a few of my failures with this method. And this very trouble bars me from using this preparation on any of the anterior teeth until we have further enlightenment on the question.

The case I have in mind was that of Miss O. The upper left central and lateral incisors contained devitalized pulps, that of the central incisor having been in this condition for ten years on account of a gold filling encroaching upon the pulp. The tooth was the color of lead. Applications of tricresol and formalin bleached the lateral incisor, and its color is now perfectly normal. The central incisor, however, did not yield so readily to the treatment. The tooth was made ready for a second application, after the root-canal was filled to the apex with zinc oxychlorid. Because of the neutralizing effect of the tricresol and formalin upon the gases of putrefaction, I thought it advisable, from a clinical standpoint, to seal in the tooth a larger dose of the neutralizing agent, in order to thus obtain the benefit of a stronger bleaching action. The tricresol remained in the tooth for a period of one or two days. The patient was very anxious to have the tooth white for Easter. I next made an application of twenty-five per cent. solution of pyrozone, and two or three days before Easter I had the pinkest tooth I have ever seen. Knowing that alcohol would neutralize the action of the formalin and tricresol—being so close akin to it—I made applications of alcohol, which removed practically all of the pink coloration. The tooth changed from a lead color to an unsightly brown and I made successive applications of alcohol every three or four days. That was before Easter, and while the tooth does not look so bad it still has a pink appearance, although I expect that in the course of time it will assume its normal color. This is a bad result, due to a lack of knowledge of how to counteract the effect of the tricresol. The lateral incisor is of normal color, and the question which now arises is, Will that tooth remain normal after it is filled with cement, as has always been practiced after the use of bleaching agents? I do not know. The other tooth, however, I expect to clean with alcohol, and to bleach with pyrozone, and I do not think that it will cause any pink discoloration at all.

Notwithstanding the good results brought about by the use of tricresol and formalin in the majority of cases, would we be justified in incurring the risk of discoloring the tooth, when we know that for cleaning the root-canal we can use such remedies as dilute sulfuric acid, which will not affect the bleaching process later on, but which will result in a beautiful white tooth forever after? Devitalized teeth, bleached and filled on scientific lines, when seen ten years after treatment will not show the slightest sign of discoloration.

Dr. **Sidney S. Stowell**, Pittsfield, Mass. I have not used the treatment as prescribed by Dr. Buckley other than the occasional use of formalin. I will therefore only refer to some general principles. I estimate that there are thirty thousand dentists treating and filling devitalized teeth by twenty thousand different methods, all claiming a large percentage of successes. Modifying this estimate, it is not likely that five thousand dentists treat and fill all canals in exactly the same way.

Immediate root-filling has become an

almost universal practice, and I estimate that ninety-five per cent. of these cases—where reasonable care has been used—are successful; and where a fistula exists, and reasonable care is used, all are successful, no matter what method or material be used, except in the case of a fistula of long standing where the apex of the root is literally dead, and in this case nothing will effect a cure. Amputation of the root will help the case and prolong the life and usefulness of the tooth. When the canals are thoroughly cleansed, washed out with alcohol to which has been added a little hydronaphthol, the canals filled with gutta-percha, and the bulk of the pulp-chamber with zinc oxyphosphate cement, to which a little hydronaphthol has been added, we have done all that human skill can do, and we must trust to God for the result. This treatment will be successful in the ninety-five per cent. of cases referred to, and the other five per cent. would kick anyway out of pure cussedness, whether treated by Dr. Buckley's or any of the other twenty thousand methods. I do not refer to those cases where a portion of the pulp remains alive, or to those that are inaccessible, for they should be classified under a different heading. In such cases the remaining live portion of the pulp should be devitalized and removed if at all possible; if not, they should be treated as the ancient Egyptians treated their dead, and they will remain quiet just as long.

Dr. B. C. NASH, New York. Considerable stress is laid upon the use of the rubber dam in connection with the first application, in order to produce asepsis and to maintain it throughout the treatment. Now, I question whether in practice the majority of us are in the habit of applying the rubber dam in the treatment of pulpless teeth, especially where the affected tooth is aching severely. Personally, my first desire is to relieve the patient of distress, and I find that the quickest way of accomplishing this is to get right at the seat of the trouble with no previous elaborate preparation, without subjecting the patient to any new annoyance, and as Dr. Perry recently expressed it, to sneak a hole into the pulp-chamber as quickly as possible. If there were no pus present, it would be a suitable case for the use of this remedy, and there would be a strong probability that the patient would feel relieved in a short time, and that after one or two treatments the case would be carried to completion. But my experience has been that where the opening of the pulp-chamber determined the presence of pus, we had better follow the old method of drainage in order to free the canal from every particle of pus, and then somewhat tentatively we might proceed with this remedy for the after-treatment. I had a case only a few days before I left home; an aching upper left lateral incisor, filled with cement, no opening or communication with the mouth, no fistula, where in one or two revolutions of the bur I immediately punctured the pulp-chamber and the pus flowed freely. I allowed the tooth to remain open for two days, and on the morning of the third day I applied very carefully this remedy, sealing it in with gutta-percha, being careful not to exert any pressure. By night I had to remove that dressing and again allow drainage, and the tooth is in that condition now. Whether the use of this remedy in that particular case will control it remains to be seen. I am inclined to think that before it is brought under control an artificial fistula will have to be made for drainage.

I think Dr. Buckley has advised against the use of this preparation where there is any question as to a thorough removal of the pulp having been effected, for in such cases very serious results are liable to follow.

These are simply one or two points that have come under my observation that I felt might be interesting as touching upon the use of this remedy.

Dr. H. W. GILLETT, New York. I want to call your attention to one possibility. Dr. Shields suggested that in his unfavorable case the irritation was due to an insufficient amount of the remedy. I have seen some instances in which I felt that a similar result was due to too much formaldehyd. If there is too much formaldehyd and the gas is evolved too rapidly, it acts as a violent irritant. This is one of the possibilities, and one difficulty in using the combination that Dr. Buckley suggested in certain cases seems to me to be in deciding just how much to use. We have formaldehyd at our command in two forms; the aqueous solution, commonly called formalin, and the solid, paraform. Paraform sealed into a cavity is gradually transformed into the gas by the warmth of the body. If used in cavities, when moisture reaches it the evolution of the gas is generally too rapid. There are many cases in which it seems to me that more satisfactory results are obtained with paraform alone than with the combination of formaldehyd and tricresol.

I wish in this connection to call attention to what seems to me an instance of professional and commercial charlatanism. Some dentist in the far West read a paper before one of our leading societies not long ago, calling attention to what he calls "solidified formaldehyd" marketed by a drug firm somewhere in his vicinity. Now, solidified formaldehyd is nothing more or less than paraform, and can be purchased at any drug house.

Dr. W. C. Wilbur, Corning, N. Y. It is almost two years now since I began the use of this preparation. At the last meeting of the State Society I reported what success I had had, and I want to say that I have been using it since that time whenever indicated. Dr. Gillett I think has solved the problem of the tooth that continued to give trouble after the application of the medicine. I think it was caused by the use of too much of the preparation. Formaldehyd gas was formed faster than the system could absorb it, and it irritated the tissues and kept up the trouble.

Dr. Buckley—as I understand him from reading his papers, hearing him speak, and in conversation with him—does not suggest this preparation in abscess cases. He has a different formula for that—formaldehyd and sulfuric acid, I believe. It is only where the pus has not actually formed that this preparation is to be used. I have used it in any number of cases where there was intense pain and swelling, and where it looked as if the tooth would shortly afterward become the seat of an abscess but where the formation of pus had not actually taken place, and invariably it has relieved the difficulty; but I have not been brave enough to try it where the cavity was full of pus, and where there was no fistula present.

Again, failure to obtain good results may be traced to the pressure exercised in inserting the gutta-percha when sealing in the preparation. I think the avoidance of pressure will eliminate most if not all of this trouble. Another thing, Dr. Buckley does not advocate its use in proximity to a live pulp, but in the cases where he does recommend it it acts beautifully, viz, where there is a putrescent pulp. In some cases it acts at first—for about a quarter of an hour—as an irritant, and then the pain quickly subsides and the condition is relieved.

With regard to discoloration, I want to say that I have not had any difficulty in the matter of discoloration in the two years, nearly, that I have used it. Discoloration was not due to the preparation, but I think it was from the after-treatment. We must not hold the tricresol and formalin responsible for what is caused by something else. I have never had a case of discoloration, and I have used it very successfully in the presence of pus where there was a fistula present. And, furthermore, I want to say that I use it frequently where there is partly live tissue present in a putrescent pulp-chamber. In the cases of root-canals containing partly live tissue, however, it was used preparatory to the application of cocain applied under pressure prior to the removal of the remaining portion of the pulp, the object being to make the parts aseptic before applying the anesthetic. My practice consists, if the pulp be partly alive and so painful that I cannot remove it with a broach, in closing-in the tricresol and formalin in the pulp-chamber until the following day, when, the chamber being thoroughly aseptic, I can produce pressure with the cocain against the remaining portion of the pulp without the danger of driving the aseptic matter through the foramen.

Dr. WM. JARVIE, Brooklyn. I do not wonder at the Correspondent being discouraged at the results of his endeavors to collect data in regard to this treatment, but there has not been the indifference to his efforts which the figures would seem to indicate. I think that all of us are apt to lay aside a document and overlook it when it is received some six or eight months before it is to be used. I did not send in any report, yet the Correspondent's communication has been on my desk ever since it came, and I have been constantly interested in the subject. I have no doubt but that such is the case with a large proportion of the members, and I am sure that if he had sent out a postal card to them a month ago, instead of having nine replies he would have had ninety. In conversation with various dentists throughout the state, I have found that this has proved to be, among a host of topics, the most interesting one. My experience in the use of the preparation of tricresol and formalin has not been so extensive as that of some others. It has been my good fortune to have had very few putrescent pulps to treat in the past few months. A practitioner told me he had treated forty cases in two months. I pity the man who has to treat so many putrescent pulps as that in such a short time, because it is the most annoying and oftentimes disappointing and aggravating condition with which the operator has to deal. The result of my use of this preparation has been most successful. I have had some of the most beneficent results in treating that class of cases that I have ever had in my practice. I will not go into the details, because you have all had similar cases. I will just tell you of one that I have treated within a month.

A lady came into my office suffering from pain in the lower left bicuspid. The tooth was free from decay, and had never been opened. There was some swelling, and so much pain that it was difficult to open into the pulp-chamber. I did open into it, however, liberated some pus, applied tricresol and formalin, and sent the patient away for a couple of days. She came back two days later greatly relieved, and I opened quite thoroughly into the pulp-canal, filled it with tricresol and formalin, sealed up the cavity with oxyphosphate cement as before, and let her go for ten days. Just recently I spoke to her over the telephone and she said that she had forgotten about the tooth, that the pain had entirely disappeared and that there was no swelling. Two days later I found the conditions just as favorable as I could wish.

My method of filling roots after treating with this preparation is to dry the root-canal as thoroughly as possible; put in the electric needle, turn on the current, and by this means get the root as dry as possible. While the root-canal is still in this dry condition, I fit a gutta-percha point as accurately as possible, leaving it a little longer than the canal. I then flow eucalyptus oil into the canal, and after dipping the gutta-percha point in the eucalyptus oil for about ten seconds I place it in the canal, work it up and down two or three times, and then press it to place.

Dr. C. F. ASH, Brooklyn. I want to offer an apology to the Correspondent. I had a list of cases treated by this method, but I neglected to send them to him, and he has asked me to speak upon the subject. With one exception I have had universal satisfaction with the treatment, and in that one case I neglected to clean the cavity out properly, for which purpose I usually precede the treatment of tricresol with Schreier's paste.

Dr. M. L. RHEIN, New York. I think I echo the sentiment of Dr. Jarvie and Dr. Ash when I say that the Correspondent is somewhat to blame in this matter. He should have sent postal cards to remind us of this report.

There is no difference of opinion between Dr. Buckley and myself on this question of root-technique, but Dr. Buckley's method of treatment has been misunderstood and misinterpreted, as is evident in the discussion which has just taken place. He is absolutely opposed to its use in all teeth where there is any living tissue left; neither is it a good thing to use in the presence of a periapical abscess. It is meant for application in the crown of a tooth where there is a putrescent pulp. The material is not to be introduced in the interior of a root, but it should be applied within the crown before the tooth has been operated upon at all. Under these circumstances the tooth can be hermetically sealed, and there will be no subsequent discomfort. A great many of the supposed failures with this method on investigation reveal the fact that it has been used for some different condition of affairs than advised by Dr. Buckley, and the practical point out of this is that Dr. Buckley never meant it to be a specific method of treating every sort of trouble in root-canals. This is a point that should be well understood.

Dr. E. A. SMITH. In the May issue of the COSMOS I read a discussion of Dr. Buckley's paper by Dr. Rhein before the First District Dental Society, in which he said that he had attended a meeting of the Fifth District Dental Society at Rome, and that at that meeting a gentleman, who had been at Albany when Dr. Buckley presented his paper last year, gave a paper in which he stated that he had tried this treatment a number of times, and that in over fifty per cent. of the cases treated it had been a decided failure. I want to say that Dr. Rhein must have a very poor memory, as I stated in my paper that out of forty cases I had had only three failures. Dr. Rhein also produced the impression that I thought Dr. Buckley's treatment a failure. I was farthest from that—because in the opening of the paper I stated that I considered Dr. Buckley's paper to be the greatest addition to dental therapeutics in the last decade. Further, Dr. Rhein said that I used the treatment in cases where it was contra-indicated according to Dr. Buckley's views. I want to say that this is untrue, as I have used it only in strictly putrescent cases. He also said that the trouble was caused by having pus in the canal, and leaving the treatment in the tooth for twenty-four hours and longer, thus causing periapical inflammation. This is also untrue, as in the cases where bad results were obtained the trouble occurred within the first twenty-four hours.

I simply wish to say this in justification of myself; and in justice to Dr. Buckley I wish to say that I did not say that over fifty per cent. of the cases that I had treated by this method had been failures.

Dr. RHEIN. I am sure the gentleman has misunderstood me. I never made any such assertions as he has mentioned here. In my remarks in reference to the Rome meeting I spoke of a report of cases by a large number of the members of the society, not of one individual. Who reported these I do not know, but in the discussion I spoke of the use of the treatment by different members of the society and the various results as reported. I did not say anything in reference to any paper by any individual, and I regret that Dr. Smith supposed that I had reference to what he personally had to say on that occasion.

Dr. HILLYER (closing the discussion). It seems that several have misinterpreted what I said at the end of my report. I repeat that only time and experience can teach us just how much or how little of this preparation to apply in a given case, and we will have a percentage of failures, for failures are bound to occur, and will be accounted for by that personal equation that enters into the treatment of each and every case.

With regard to the case reported by Dr. Shields, I think it is hardly fair to present a tooth that has been in a bad condition for ten years, and having treated it, blame the failure of that treatment upon tricresol and formalin.

I am not here to defend Dr. Buckley, and I simply reported my case as one of the few in which I have failed.

ELECTION OF OFFICERS.

The hour of five o'clock having arrived, the special order of business, the election of officers for the ensuing year, was taken up, with the following result:

President—W. A. White, Phelps.
Vice-president—W. S. Rose, Schenectady.
Secretary—C. S. Butler, Buffalo.
Treasurer—C. W. Stainton, Buffalo.
Correspondent—S. L. Goldsmith, New York.

On motion the President-elect was empowered to appoint delegates to the National Dental Association at its annual meeting to be held in Atlanta, Ga., on the third Tuesday in September next.

The meeting then adjourned until 7.30 P.M.

FIRST DAY—*Evening Session.*

The meeting was called to order by the president, Dr. W. J. Turner, at 7.30, and the first order of business was the reading of the report of the Law Committee, by Dr. WM. CARR, chairman.

On motion by Dr. Jarvie the report of the Law Committee was received and accepted, and Dr. Carr directed to register himself as a representative of the Dental Society of the State of New York before the legislature at Albany, in accordance with a recommendation by the committee as follows:

> That because of the new Corporation Act, some individual be appointed whose duty it shall be to register himself at Albany under the provisions of the new law and take care of legislation that may be proposed, and endeavor to defeat all bills which do not bear the indorsement of the State Society.

The subject was then passed, and the next order of business was the reading of a paper by Dr. EDWARD C. KIRK of Philadelphia, entitled "Pioneer Dentistry in New York: an Historical Study."

[This paper is printed in full at page 981 of the October issue of the COSMOS.]

Discussion.

Dr. R. H. HOFHEINZ, Rochester. Of all the papers I have ever discussed, this is the most difficult one. What can I say against historical facts, especially when presented in such a masterly way? I looked for additional data in a "History of Dentistry" by Geist Jacobi, and found that the names of Wooffendale, Daniels, Greenwood, Baker, etc., are not mentioned. I laid away that wonderful historical work, and then said to myself, If there be nothing to discuss in the paper, because it deals with well-established historical facts, what can it *teach* us?

What force or influence can act the part of a teacher to better advantage than the past? The facts behind us are the forces which shape our own doings, and frequently our own lives. There never was a time, however, when we had less time to think of the past.

Dr. Kirk tells us that the study of individual character may be taken up as a pastime, from motives of curiosity, or its end may be utilitarian or scientific. We know Dr. Kirk too well to think that he has resuscitated these individual characters as a pastime or from motives of curiosity. He must have had a distinct purpose in his mind. There never was a time when we were in greater need of the study of history and of being reminded of the fact that before us lived many men to whom we owe our own successful existence in this profession.

In looking over the vast dental literature of today, one is appalled and at times amused at the lack of recognition of the great men who have passed before us. Every writer—and it seems that every dentist is one—appears pregnant with the idea that he is presenting a new Mosaic law to the profession, but alas, how few Moseses dentistry has had! True it is that there is no such thing as absolute originality. A great writer says: "As soon as we are born, the world begins to work upon us, and this goes on to the end. And, after all, what can we call our own except energy, strength, and will? If I could give an account of all that I owe to great predecessors and to contemporaries, there would be but a small balance in my favor." A great man can easily say that; a small man frequently thinks the reverse.

It is a most opportune time for such a paper as Dr. Kirk has read to us. The influence of great predecessors upon ourselves is never-ceasing. The stimulating influence of one single personality is often carried through one's life.

The essayist speaks of Amos Westcott. When a beginner in dentistry I was introduced to him by Dr. Frank French of Rochester. I was not then mature enough to have known the meaning of that event, but I instinctively felt that I was in the presence of a great man of our profession. Who could ever have seen W. H. Atkinson operate, or heard him speak, even after age had made his statements diffuse at times, without coming away a better dentist? His personality infused such a great amount of enthusiasm, by reason of his marvelous personal magnetism, that every one of us who was fortunate enough to have known him *had* to be benefited, *nolens volens.*

It is not my intention at this time to mention all the other great men mentioned by the essayist. Let us take but one other extreme, Dr. Heitzman, not a dentist. This terribly temperamental teacher created an entire school of his own, and at this very day the son of his greatest disciple, Dr. Boedecker, is giving the profession a series of scientific investigations in dental histology.

And thus we have the chain-like working of influence from one generation to another. Yes, some of the small and seemingly absurd ideas survive and are carried down from one generation to another. We may smile at Richard Dufort Dustwige, surgeon from Europe, midwife, oculist, and dentist, who in 1777 advertises for human front teeth and gets them at four guineas apiece; but in contemporaneous times almost similar instances are recorded.

About twenty-three years ago, when on one of my European visits, I stopped with Dr. Thomas of Vienna. A lady from a neighboring city had lost a front tooth from pyorrhea. She brought that valuable organ most carefully wrapped up in tissue paper, and insisted that the natural tooth must be replaced in some way. Dr. Thomas was not well and he left the matter to my decision.

Replantation was out of the question, and as she had to have that natural tooth in place I took an impression, made a small plate, and vulcanized a gold pin in the direction of the root. A cavity was drilled into the lingual pit of the central, the tooth properly adjusted to it, and finally cemented on the pin; thus making a plate holding the natural tooth. A duplicate plate was made and someone else's tooth was used. The good lady evidently considered them cleaner than an artificial substitute. She may have changed her mind by this time. It simply shows that "history repeats itself" even in such small details.

It is a most difficult thing for the general practitioner to spend his time in historical research. The deluge of everyday dental literature is about all he can successfully read without committing suicide. It is left for such men as Dr. Kirk to bring before us papers such as we have had the pleasure of listening to today. I go farther than that: It becomes not only the duty of such men to delve in past history, but it is their duty to write contemporaneous history. The happy position which, together with a few others, he occupies, enables him to look at dentistry from a more objective standpoint—the only correct one for the historical writer to assume.

History must be written not only by an able man, but by one who can view a question from all its aspects if it is to be true history and such as will influence coming generations. As the doctrine of evolution has illuminated every problem of human thought and human action, thus should the influence of history and the study of the individual stimulate our daily actions.

Dr. Wm. Jarvie, Brooklyn. We have all been greatly interested and instructed by Dr. Kirk's paper. I feel under a deep personal obligation to him for it, for I have been endeavoring for the past ten years to get different men in New York take up this work and resurrect from oblivion matters on record which relate to the early dentists in this state. This paper by Dr. Kirk is the result of much labor, involving an immense amount of research, delving, studying records, and the expenditure of much time. A few years ago it became my duty to write a history of dentistry in Brooklyn. There was little or no material at hand and I bethought me of the directories. Going to the Long Island Historical Society I found a complete file of directories dating from 1826, in which I unearthed a great deal of interesting matter, and much that was new and valuable in the advertisements connected with these directories. As Dr. Kirk has demonstrated, the directories must have been largely used by professional men one hundred years ago, and even fifty years earlier, to call the attention of the public to their work. And as he has told you, while these advertisements undoubtedly appear rather strange to us now, at that time they were considered both proper and ethical. The earliest I could learn about any Brooklyn dentist's history dates from 1828. I had not seen this paper until it was read before you, and I did not know what line of thought Dr. Kirk would follow. If I had, I should have brought with me some data which would interest you. But what I want to impress upon the gentlemen here tonight more particularly is the necessity of having facts and dates absolutely accurate in recording historical events such as Dr. Kirk has presented, for otherwise we may be led very sadly astray at times. The "History of Oral and Dental Surgery" by Dexter has been referred to, and Dr. Kirk told you of several inaccuracies that occur in it. One year ago, in my annual address to this society, I wanted to be exact as to the first one who suggested the filling of teeth with gold foil, and taking it for granted that the statements in the book referred to were correct, I said that Fauchard was the first to advise the use of gold for that purpose. Dr. Kirk read my address before it was published, and kindly wrote to me that I was in error, for the use of gold foil was advocated in a work in his possession printed in Leipzig in 1560, two hundred and thirty years before Fauchard. It would really seem in the light of what we have learned, that there is nothing new in dentistry. For instance, we learn that one hundred and fifty years ago—that is if we can place reliance on the advertisements of the dentists of that time—they recognized and were able to treat pyorrhea alveolaris with all the success that Dr. Smith of Philadelphia and Dr. Rhein of New York are credited with today. Although we may hardly accept these advertisements as more than promises, still the claims made in them are certainly no less than the results of the efforts of the best operators of our time. We may be more successful than they were, but this to a great extent is due unquestionably to our more thorough work and to the knowledge of antiseptics, which they did not have.

We are doubly indebted to Dr. Kirk for resurrecting these facts from the oblivion in which they have remained for so many years, and I hope someone will take up this line of work where Dr. Kirk has left off and reduce it to such shape as will render it of value to all. There are men in this society who can get at the facts which are recorded at the present time. A generation is rapidly passing away, and in only a very few years it will be much more difficult than it now is to obtain the data that otherwise will be lost to us forever.

Dr. Kirk (closing the discussion). I am very much surprised to find that the paper could be discussed at all. I did not expect Dr. Hofheinz or Dr. Jarvie to discuss it. I did not see anything about it to discuss, but I did hope to interest some of you in this matter, and if I were not a visitor to this society, I would make a motion that a committee be appointed to collect the data relating to the history of the dental profession in New York state. Throughout the state there are practitioners who are close to the source of information, and it would be well for them to organize and combine for the purpose of resurrecting these facts. There are considerable historical data in the western part of the state that need to be collected. The whole period between 1812 and 1835, about sixteen years, ought to be secured. It is strange to my mind that the story of the Crawcours has not been written. It is related in some of the magazines that so heated did some of the dentists of that day become in their antagonism toward these mountebanks, that they swore out warrants for their arrest, and when they tried to escape from the country a committee went down the harbor in a boat to overtake them, but they succeeded in escaping. It will take a long time and considerable work to go over the papers of New York during that period, but it can be done and the facts can be worked out. The same can be done also with the records of the Onondaga County Medical Society; these records are, I believe, in Syracuse. I would like to see a committee from this society take this work up seriously and resurrect these things, not only for your sakes, but for that of the history of the dental profession in the United States of America.

Dr. Kirk's paper was then passed.

(To be continued.)

PENNSYLVANIA STATE DENTAL SOCIETY.

Thirty-eighth Annual Meeting.

The thirty-eighth annual meeting of the Pennsylvania State Dental Society was held in the Clover Room of the Bellevue-Stratford Hotel, Philadelphia, June 26, 27, and 28, 1906.

TUESDAY—*Morning Session.*

The first session was called to order by the president, Dr. H. W. Arthur, Pittsburg, Tuesday morning, June 26th, at 10 o'clock.

The meeting was opened with prayer by the Rev. Geo. S. Gassner, Philadelphia.

The Hon. John Weaver, Mayor of Philadelphia, was introduced by President Arthur, and made an address welcoming the assembly to the City of Brotherly Love.

The next order of business was the reading of the President's address.

Dr. J. T. Lippincott, the first vice-president, was invited to the chair while the president, Dr. H. W. ARTHUR, read his annual address, as follows:

PRESIDENT'S ADDRESS.

It is with some degree of temerity that I have assumed the duties incumbent upon the presiding officer of this society. I shall not, at this time, attempt to philosophize on its duties and scope, but, following the custom of those who have preceded me in this office, I shall endeavor to name and treat of those subjects of pressing interest that demand our attention.

A question always of urgent importance, and one that has been a common theme with my predecessors, is that of interesting all reputable practitioners of Pennsylvania in the State Society. With this end in view, from time to time, plans have been tried that have proved ineffective in securing a permanent increase of membership.

We have learned, if we did not already know, the conditions and attractions which will draw a large number to our meetings. The number present at our last meeting was without precedent. Our present meeting, under like conditions and inducements, will no doubt excel in point of attendance. Of the estimated number present at our last meeting, comparatively few were added to our roll, and the question is, How many of those who did enroll can be counted upon as followers?

More thorough organization is what we need. All reputable practitioners in the state should be affiliating members of the State Society. Kindred organizations in our own and other states have urged and effected more thorough organization, and more perfect organization has been urged on the following grounds: "The scientific work of the society would be of a higher grade, and the various committees would be able to locate more easily the men who are doing interesting work. Ability to secure desirable legislation would be increased. We would be in a position to give our Committee on Enforcement of Dental Law more effective assistance in locating and punishing illegal practitioners. The chairman of a committee would be assisted in locating men outside of his personal acquaintance, who could be invited to take part in our program. It would bring about a closer relationship between the different sections of the state."

There could no longer be given the excuse for holding aloof from the state society that one section of the state exercised a predominating influence over other sections. There are other reasons for urging this more thorough organization, but they are so self-evident that we will not delay to mention them.

As to how this more perfect organization may be brought about, we cannot do better than inquire into the methods made effective by other similar organizations. We are not prepared for reorganization, but some of these methods might be engrafted upon our present organization. That which appeals to us as most feasible is known as the "group plan," somewhat similar to the "districts" in New York state. The bankers of this state have a group plan of eight districts; that, it seems, would answer our purpose. One advantage of this plan for us would be that the present local societies could be used as centers for grouping counties. Another would be, that should we wish to effect county organizations, which we will consider later, it would be a means to that end.

The plan which we advocate is not so thorough as that of the State Medical Society, which aims to have a society in each county, each society being given the significant name of component. Members of the county society are affiliating members of the state society. The latter is made binding by having the membership fee in the state society included in that of the county society, and this is secured to the state society by an equal per capita assessment on the county society. It seems that the group plan, embracing affiliating membership, could easily be made effective in connection with our present organization. Delegates could be appointed from groups in the same manner as at present from the local societies. The delegates would constitute the legislative body of the State Society, affiliating members having all rights and privileges other than legislative. Other details could be made to fit in with our present state organization. The procedure would be to appoint one person from each district, called an organizer (a significant name), whose duty would be to canvass and continue to canvass every county under his jurisdiction until all reputable practitioners were induced to become members of the group society.

In every movement there is a time for decisive action. Believing as we do that in this matter the time for action has arrived, we respectfully recommend and urge that a committee be appointed, consisting of one member from each district of the state, as may be decided, whose duty it shall be to canvass his own district, and so over the whole state, soliciting all reputable practitioners to become members of a group society, said committee to present at this meeting such amendments to the by-laws as shall be necessary to effect this more complete organization, and to be given power to act in the interim.

The estimated number of dentists in the state in 1905 was 3289, and to this a considerable number may now be added. Of the total, 271, or about 8 per cent., were members of the State Society, leaving more than 3000 who have no affiliation with the said society. We claim to be a representative body, and are ready to plead this when seeking legislation, and as such we are accorded privileges by law. Let us endeavor to make good our claim so far as lies in our power. Those who may deliberately refuse to affiliate with the State Society cannot then plead that they are without representation. The State Medical Society is very active and persistent in this matter, even setting aside differences as to school. It has been intimated that dentists may soon be included in its canvassing.

HISTORY.

This thirty-eighth annual meeting coinciding in number with the years that your presiding officer has been in practice, naturally inclines to retrospection. It is not our purpose so to indulge, nor would it be in place at the present time. In this connection, however, and in view of the fact that the profession at large is engaged in gathering and making records of the past, and in anticipation of the completion of another decade of this society two years hence, would it not be in order to take action in anticipation of that event, toward the preparation of a history of this society for the past forty years, and present it on that occasion?

Many members of the Pennsylvania State Dental Society have taken an active part in making the history of the profession at large, which will, no doubt, receive due consideration, biographically and otherwise. The Pennsylvania State Dental Society should have regard for that which belongs to it in this line. The records of our transactions, even if complete, which they are not, are not readily accessible, and in the form in which they exist they may not excite interest in the stirring progress of events. A compiled account of the origin and progress of principles and practice, together with a record of men and events within our borders, could not but awaken interest. Delay may cause us loss of reminiscences interesting and valuable.

A glance at the names of the charter members of the State Dental Society reveals significant facts in this connection. Holding in high esteem as we do those that remain, and recognizing their ability, would it not be crowning their years of membership in this society to compile and add their personal recollection of men and events in a connected history? A request to the venerables to take up this work, if it may be thought best by the society, we hope will meet with favorable response. In this connection, and in view of action that may be taken, would it not be well to institute the office of historian, so that events added each year would keep complete the former records? As already stated, our minutes are incomplete; four consecutive years are missing, as are also three other years, with the intervening two and three years respectively supplied (viz, 1872-73-74-75, 1882-85-87). It is all-important that action should be taken to recover the missing minutes, if they are in existence in written or printed form, as they include important transactions of this society.

The year that has elapsed since last we met has not passed without leaving in its wake a feeling of regret for the loss by death of one of marked personality, whose straightforward, earnest utterances were for the best interests of the dental profession and this society: The labors of Dr. C. C. Beck are ended. Let our records bear testimony to our esteem.

RECIPROCITY.

Reciprocity is a subject that we have with us and are likely to have with us for time to come. The solution to this question would be in having the legal requirements to practice identical in all states. As guardian of the dental laws of the country, it seems that the National Association of Dental Examiners should be the body to act in bringing about a uniform grade requirement in all states. In time this will, no doubt, be brought about; meanwhile some will suffer hardship. While there might not be any injury done through the licensed dentists from Pennsylvania practicing in other states, there certainly would be an injustice in allowing, without discrimination, dentists from other states to practice in our state. The fact that students are personally solicited to register in border states, and that graduates from our colleges before taking the state board examination, go from state to state, and by simply paying a registration fee are allowed to practice, shows the necessity for selection with a view to exclusion.

It is a hopeful sign of the times that some of these states are awaking to the necessity of raising their standard and enforcing the requirements. There is a class of practitioners, however, for whom it seems that exception might be made. We refer to those who for years may have conducted a reputable practice in one state, and who may desire to locate in another. The fact that they have maintained the profession in reputable practice, upholding the law in its relation to those whom it seeks to protect, *i.e.* the public, should entitle them to special consideration. The fact that they are reputable practitioners, and that this is vouched for, ought to have weight with a properly vested authority. We are prompted to suggest, in this connection, that a law giving discretionary power in such cases, and within certain limits to the State Board of Dental Examiners, would relieve the situation. Such a law, if agreed upon by the National Association of Dental Examiners, might be made reciprocal among the states.

DENTAL EDUCATION.

Dental education is a subject that does not lose its interest. It is not our purpose to discuss this subject in detail, but rather to refer to an element thereof in the furtherance of which all should be interested and have part.

Dentistry has assumed the dignity of a profession, and the dentist that of a professional man. To maintain this, we as members must have the qualities that belong to a profession, placing it on a plane higher than that of a trade or commercial pursuit. These qualities, for us in common with all professional pursuits, are attainments in learning and the seeking of knowledge both general and special. This being true, those in charge of our educational institutions, our societies, the profession at large, and the individual, should fulfill their part in maintaining professional dignity.

Our colleges, as a class, are doing an excellent work in laying the foundation and promoting special education. The attainment and maintenance of professional rank depend so much on the class of men entering our calling that we cannot magnify its importance too much. The standard of preliminary requirements, no matter what that may be, is not a safeguard, nor will it be until the mercenary features are eliminated. If it were possible to exercise a censorship during the freshman year, weeding out those wanting in intellectual and manipulative capacity as well as morality, the dignity of the profession would be much less difficult to maintain. We have no comment to make on those lacking intellectual capacity, but they are in evidence. The lack of manipulative capacity is only too conspicuously observed in those who have entered the ranks of the profession, working ill to themselves and to the public, and detracting from the dignity of the profession.

No testimony is needed to convince those who have passed through our institutions that the moral qualities, as to rights of property and otherwise, are sadly wanting in some students. If these could be eliminated, the ranks of disreputable practitioners—such as the dental laws do not exclude or prohibit from practicing—would thus be depleted. That they detract from the dignity of the profession in the eyes of an indiscriminating public is only too true.

As a representative body, the State Society should be in the forefront in exemplification of professional status. Our proceedings should give evidence of our attainments, and an evident, earnest pursuit of knowledge in our specialty should command respect. By broadening its field of usefulness the State Society may reach those in the profession who, through sordid indifference, weigh heavily against those who seek to maintain rank and to elevate the profession.

The profession at large should be encouraged to observe strict ethical relations, and the individual a dignified professional self-respect, having no apology to make that his title of D.D.S. is not

M.D. or some other doctorate. Our claim to a profession, to be sustained, must be something more than an assumption: The test is its fruits.

This society at the meeting of 1904 indorsed a resolution, "respectfully requesting the Honorable Secretary of War to recommend to Congress the passage of a bill creating a commissioned corps of dental surgeons to be attached to the medical department of the army, with the grades, viz, first lieutenant, captain, major, and lieutenant-colonel; with pay, allowances, promotion, and retirement of officers of like grade in the medical department."

It is gratifying to know that the "standing and dignity of scientifically educated dental surgeons," as set forth in the preamble of the above resolution, has been recognized by the United States Senate by the passage of a bill granting in full the request made in the resolution, other than that the grade of commission was limited to that of major. It is to be hoped that the seeming differences in the ranks of the profession will not stand in the way of concurrence of the United States House of Representatives in this act, and of its thus becoming a law.

COMMITTEE ON ENFORCEMENT OF THE DENTAL LAW.

The Committee on Enforcement of the Dental Law, through its chairman, has secured decisions that as precedents are invaluable. Through its efforts, weak points in the dental law have been made apparent. Unless we are willing that the dental law should become a dead letter, this committee should be encouraged to follow up the good work begun. In no way can we hold up its hands more effectively than by bringing the profession in all parts of the state in touch with the State Society.

LEGISLATIVE COMMITTEE.

The Legislative Committee should be incited to make renewed effort to secure enactments that failed to become law on account of executive veto, and such other enactments as the counsel of this society may deem wise. Repeated returns to the legislature are apt to weaken our cause, and should be avoided. Two forms of fraud against the dental law have come to light; one the application to the Dental Council for a duplicate license on the ground that the original license had been lost or destroyed. The supposition is that in some cases the original had been disposed of for a consideration. This latter the Dental Council at the last meeting endeavored to meet by authorizing the issuing of a certificate in such cases instead of a duplicate license; the other form is the personating another at the time of the examination by the Board of Dental Examiners. The daring of this fraud is only equaled by the ability to perpetrate it. Some form of legislation should be devised to meet these frauds.

PRACTICE.

The use of porcelain in operative dentistry is a practice so well established and the demands for it are such that those who have deferred taking it up can no longer do so, nor give as an excuse that the porcelain inlay is in the experimental stage. Some have hesitated, it may be, on account of the manipulation being so different from that of other operations that it requires a development of skill to reach the measure that porcelain art demands. This very feature makes it a welcome addition to our practice.

The development of our manipulative skill, together with the artistic perception, will not only benefit the operation, but will add to professional standing with the public. The ease with which some plastic filling materials are introduced does not develop skill, but on the contrary leads too often to careless manipulation, with the result that our calling is underrated. While welcoming porcelain, we would not underrate the old and tried materials and methods, as some porcelain enthusiasts would have us. The judgment of the operator is only taxed the more to decide when in doubt what material or method to apply.

A practice that should be advocated—not because it has not been advocated heretofore, and that ably, but for evident want of appreciation by many in the profession and consequently by their patients—is the prophylactic treatment of the mouth. The term *treatment* appeals to many as something more than cleaning the teeth, which some are apt to think is all that is included in this practice. The treatment requires persistent effort rather than extraordinary skill. Thoroughness should be the watchword, and appointments should be made at regular intervals, not allowing any relapse in the hygienic condition of the mouth. This latter should be under the control of the operator. The ounce of prevention here referred to we have been slow to apply effectively, although we have always had it at hand.

With these suggestions, brief and general, we defer to our program to present more at length other topics of present interest on principles and practice. Meeting as we do under such favorable auspices, let each one strive to do well his part in making the program as prepared hold its interest from the beginning to the end of our meeting. The social features of our meeting should be encouraged and enjoyed, but let us beware lest they predominate. Our program should not be slighted. As guardians of the interests of the dental profession in the state, we should endeavor to reach the full measure of our responsibility. We are making history in our sphere, and let us strive to make our record such that it may be said of us, "Well done."

Dr. J. A. Libbey moved that a committee of three be appointed by the chair to consider the President's address, and report at a later session, at which time the address would be discussed.

The motion was carried, and Dr. Lippincott appointed as Committee on the President's Address, Drs. J. A. Libbey, Robert Huey, and H. S. Seip.

There being no other business at this session, motion was made and carried to adjourn until 2 o'clock P.M.

TUESDAY—*Afternoon Session.*

The meeting was called to order Tuesday afternoon by the president, Dr. Arthur, at 2.30 o'clock.

The first order of business was the reading of the minutes of the previous annual session. On motion the minutes were passed without reading.

The next business was the hearing of reports from officers and committees.

After the hearing of the reports of officers and committees,

The next order of business was the reading of a paper by Dr. A. P. BURKHART, Buffalo, N. Y., on "A Higher Ideal in Crown and Bridge Work," as follows:

A HIGHER IDEAL IN CROWN AND BRIDGE WORK.

The absence of discussion on crown and bridge work has been noticeable at the leading dental meetings I have attended for several years. I regret exceedingly that so important a branch of dentistry has been almost overshadowed by porcelain and gold inlay work. Inlay work has its merits, and I am not one to cry it down or to belittle it. Crown and bridge work, however, has been tested for a sufficient length of time to thoroughly judge whether it be worthy of the attention of the dental profession, and but one answer can be given, and that in the affirmative.

My remarks today are entirely directed to that particular branch of crown and bridge work known as fixed or stationary bridge work, although in my practice I do not confine myself to this special branch altogether—conditions and circumstances must of necessity determine each case coming to one's notice.

In a spirit of enthusiasm I venture to say that crown and bridge work when honestly recommended, and properly and artistically constructed, is a credit to the honest and skilful practitioner, and a blessing and comfort to patients. But it has its dark side, because too frequently, by unscrupulous and avaricious men, it is employed when other means are indicated. This branch has been and is being daily abused more than any other branch in dentistry, and I therefore believe it the duty of every honest and skilful practitioner, by word and act, to elevate it to a higher plane. You may ask, How is this branch being so grossly abused? My answer is, By faulty and carelessly constructed work which too frequently fails to bear the stamp of honesty, and which is inserted in the mouths of patients and by them accepted because they are unable to note the faulty construction, the broken and checked porcelain facings, or to detect ill-fitting caps and shell crowns.

A man who will insert a single crown or bridge upon an inaccurately prepared abutment, or abutments, and depend almost wholly on the cement to keep the crown or bridge in position, is not honest to himself, and certainly has not treated his patient in a manner he would be willing to be treated were he to undergo a similar operation. Honesty toward patients, conscientiously prepared abutments, accurately and closely fitted caps to abutments, the best, up-to-date materials, artistically constructed work, and humane treatment are some of the requisites which should govern every dentist. Gentlemen, let us therefore, as ethical men, inject into our daily work the highest ideal of manhood and skill, and with each succeeding day add to our experience, ever seeking to attain to a high degree of accomplishment in this particular branch.

Too frequently we hear men say: "I'm an expert crown and bridge worker." With due respect to youth and ambition, in all kindness let me say, It takes more than a month or a year to become an expert—it takes years. This remark is based on observation of my own work, covering a period of over twenty years, and that of many of my esteemed professional brethren. With this observation in mind, I appeal to the young men in the dental profession to give their individual and careful study to every case coming to their hands, and to put forth their best efforts in the construction of these substitutes. The habit so prevalent in the dental profession of employing dental laboratories, I believe is a mistake.

As briefly as possible I shall bring to your notice an outline of the subject:

PREPARATION OF ABUTMENTS.

Having carefully fixed in my mind the crown or bridge I have determined to construct, I proceed quickly and as painlessly as possible to the reduction of the tooth-substance, having in view the proper shaping of an abutment or abutments. Much valuable time may be saved and the operation shortened for the benefit of operator and patient, by adjusting whenever possible and practicable the rubber dam over the teeth to be reduced. Carry it by means of ligatures, and clamp the rubber dam well under the margins of the gums. Teeth thus protected and free from saliva afford an opportunity for rapid reduction and shaping, and the method in order to be appreciated must be tried. The process just described will be found particularly useful in setting Logan, Davis, Twentieth Century, or any other make of crown on the six anterior teeth. While reducing tooth-structure surrounded by the rubber dam, my lady assistant directs a stream of compressed air over the tooth which is being ground, thus keeping it comfortable and cool. Circumstances govern cases, and I do not want it understood that I use the rubber dam in every case. For the rapid reduction of tooth-substance I use knife-edged disks of varying sizes. With the sharp knife-edge one is enabled to slice off the bulging portions of bicuspids and molars on the anterior and posterior approximal surfaces, and likewise the labial and lingual sides, and, this being done, the crowns will be in almost the form of a square. Next carry the now blunted disks backward and forward over the occlusal surface, thus avoiding a long-continued pressure and friction in one spot. This class of disks will avoid undue friction, and do away with the beastly jarring which a coarse stump-wheel produces on the nerves of the patients.

Having reduced the sides and occlusal surface of the tooth with the disks, I proceed with sand-paper disks and complete the final shaping and polishing of the abutments. The occlusal surface of a bicuspid or molar should be as near level as an accurate eye and skilled hand can produce. Uneven surfaces or pivoted points on the occlusal surface of a bicuspid or molar are factors in the loosening of single crowns, and even bridges. Much good will result to the patients by treating abutments when prepared with silver nitrate, as thereby sensitiveness is reduced, and the silver salt acts as a preservative to tooth-structure. One of the great sources of failure in crown and bridge work is due to defective and slovenly prepared abutments, and I therefore most earnestly urge the greatest conscientious care in this particular. If teeth are absolutely too painful for the patient to bear the operation, then with pressure anesthesia devitalize the pulp, fill the root-canals and tooth, and thoroughly complete the shaping of the abutment. If an abutment needs filling, avoid cements; use a hard and quick-setting amalgam, and when thoroughly hardened complete with nicety the abutment. At all times avoid conically shaped abutments in bicuspids and molars.

As to anterior abutments for the reception of Richmond crowns and others, I shall not take time to discuss them.

SHELL CROWNS.

With the abutments prepared when shell crowns are indicated, accurately fit either seamless or piece crown at the neck or gingival margins of the abutment. In my opinion, the chief value of the swaged seamless crown is its more artistically shaped cusps and sides, but I almost always slit a seamless crown for the purpose of accurately fitting it. For a number of years I have used with much satisfaction pure platinum crowns, the body or barrel portion of platinum, and the cusps in bicuspid crowns struck up out of pure gold. This class of crown is far less conspicuous than the all-gold crowns, because the eye catches the gold first, and in consequence the platinum portion is hardly noticed; the gold cusps are the attraction and have the appearance of a filling.

PORCELAIN-FACE CROWNS.

In the construction of Richmond crowns, anterior bicuspids, and molar dummies, when the ordinary pin porcelain facings are used, the greatest care should be exercised to keep the porcelain and pins absolutely clean. If any portion of the porcelain has been ground, it should be thoroughly polished before the backing is attached. To the facing—properly shaped and perfectly clean—fit a gold backing of No. 32-gage pure gold. While holding the backing and facing between the fingers, with a sharp-pointed instrument burnish the gold around the pins where it passes through the gold, thereby closing every minute opening, which if left open would admit of the passage of flux. If the pins are long, I chip off a portion, but never bend them. Next unite the backing and pins with wax, invest the piece, and then flow 20-karat solder carefully over the backing, little or much as the case may require. If the pins are not bent over the backing no strain is placed on the porcelain, and a facing then backed and soldered is less likely to fracture if again subjected to heat and a general soldering process.

In constructing a Richmond crown, having united the cap and dowel, next proceed to grind the facing to proper shape, and fit a gold backing from the incisal edge to a little beyond the edge or neck which is to rest on the cap. Cover the backing with wax from the incisal edge to the point where it bends over the ground or slanted portion of the facing, and from this particular point to the incisal edge flow 20-karat solder, and when finished a portion of the backing over the slanted portion will be devoid of solder. Next, the facing thus prepared is, with a minute portion of wax, tacked to the cap while carefully articulating the same. There will be a slight V-shaped space between the cap and the facing, with no exposure of porcelain. Wax to contour, invest, and solder. The little V-shaped space should be well and thoroughly filled with 16-karat solder, and the remaining contour established with 18-karat solder. A crown thus constructed has no open joints, and is an artistic production.

In building a bridge I invariably construct throughout each individual tooth or dummy by itself, and then carefully shape the bridge. This done I assemble all in proper positions, leaving for the final soldering simply the joints, and thus with a small amount of solder the bridge is completed, and the danger of expansion and contraction reduced to a minimum. This process may take a little more time, but it produces more satisfactory results.

Before taking the bite and impression, all abutment crowns should be securely steadied on the abutments with softened wax placed on the inside of the cap and subsequently chilled. The bite is then taken, a careful impression is obtained, a sump model poured, and all parts assembled, invested and soldered. As an additional safeguard to accuracy, after having taken the impression and removed all the wax from the caps, and having filled the latter with sump or any other investment material, insert in each cap a good sized carpet tack and complete the model. In case of breakage the tacks remaining in the main portion of the model become a guide to accuracy in replacing the broken parts.

The most unsightly bridges which have come to my notice are large upper arch bridges, usually embracing the canines and molars. To produce artistic results in this class of bridges I have adopted the following method: With all caps steadied in position as previously described, take a bite and then an impression. With a very slight amount of wax left on the dowel and caps of the Richmond crowns, pour a sump model, and when hard remove it from the impression. Now place on the articulator the model with the bite properly adjusted. After removing the wax bite from the model, a stiff gold wire or platinoid bar is soldered to the posterior portion of the two caps, extending from cap to cap. While soldering this bar or wire the wax in the caps and dowels will disappear, and with a little force the caps and bar will come off together. Under the bar, and between the two caps, some tinfoil is then burnished over the model to afterward prevent the wax from adhering to it, and the caps are returned to position. Next select six anterior plain teeth—such as are used in rubber work—and wax them to the caps and bar, thus forming a trial case. When thus arranged try the piece in the patient's mouth to ascertain whether the teeth fulfill the necessary requirements as to shade, width, length, and expression. By this means the selection of the proper facings becomes an easy matter. Remove the trial teeth from the canine caps, and proceed to grind and fit the facings; then back the facings as previously described, and when thus backed, after careful articulation, wax them securely to the two caps. Next remove the four incisor trial teeth, and wax them, after which by taking hold of the wire, the caps and facings are removed from the model, invested, and soldered, as previously described. When cool, and taken from investment, the bar is carefully sawed off from each cap, the crown is shaped, and each returned to its proper position. Now the assembling of the incisors becomes an easy task, because the canines become accurate guides, they having been previously tested and fastened along lines which permit of no mistake. A bridge thus constructed will never be a one-sided and unsightly affair. This method eliminates all guesswork, too frequently indulged in by some dentists.

INVESTING CROWNS AND BRIDGES.

Indifference to results and slovenly methods employed in investing crowns and bridges produce too frequently unsatisfactorily fitting bridges, and result in checked and broken facings. The habit of pushing a case into a soft and moving mass of investment, which in turn may rest in an uneven or soft surface, such as blotting paper or even common paper, is bad practice. Proper sized boxes—from the common sized sand-paper disk box to well-selected larger sizes—should be used. The boxes, thus nearly filled with investment material, will firmly hold and accurately incase every line and crevice of the invested bridge, or single crown. Gentlemen, save your sand-paper boxes; they are valuable in the investing of single crowns and small bridges.

THE POLISHING OF CAPS.

After removing with a file or otherwise the overhanging edges of plate and soldering on the Richmond caps or shell crowns, carefully—with a steel burnisher—burnish every portion of the crowns. Burnishing stiffens the gold and enables one to smooth indentations and scratches on the gold. After a very thorough burnishing, a chamois wheel with rouge will produce a beautiful finish. It is a mistake to employ for the removal of indentations and scratches sand-paper disks, pumice, etc. This method does not stiffen a crown, but reduces it in weight, and lessens its lasting qualities.

I have brought to your notice methods of exactness not altogether new, but still for a purpose. It is more than likely that many here present exercise even greater care in the construction of crowns and bridges. Now, if that be the case, have your conscientious efforts in the construction of crowns and bridges, when employing the various makes of pin-facings and ordinary cements for cementation, given you always ideal results, personal satisfaction, and peace of mind? So far as I am concerned, were the question put to me, I would answer in the negative. Much of the difficulty which surrounds our best efforts is due to the employment of porcelain pin-facings, and after we have put forth our greatest and most painstaking efforts, a bridge comes from the investment with one or more broken or checked facings, and the conscientious man becomes sick at heart. The pin-facings so largely employed are, with some slight improvement, the same product that has been used for years in the production of gold and silver plates. They may do for the latter work, but are undesirable in crown and bridge work, where of necessity many times extremely large quantities of plate and solder are used. While this defect is well recognized, there is still another, and it is this: Pin-facings in the main are too narrow at the neck as compared with the incisal edge, the result being unsightly V-shaped spaces between the teeth.

Naturally the question arises, Is there any product which overcomes the defects found in the facings we have used so largely? If there is, it must be in the detachable and interchangeable facings, which consequently are not subjected at all to heat during the process of soldering; also the facings must be of better proportions, and wider at the neck, in order to thus overcome the unsightly V-shaped open space spoken of.

For years I have taken advantage of every improvement in dentistry, and I hailed with delight the Mason facing when placed on the market. It was a product never fully appreciated by the profession, and the manufacturers should have received greater encouragement. With the lapse of time still greater advances have been made. I was induced two years ago to test the Steele detachable and interchangeable facings. I never worry now over checked or broken facings, consequently I have peace of mind. I feel fully convinced that the Steele facings in variety of molds and almost perfect proportion will greatly aid the artistic bridge worker.

With the lapse of time, I have no doubt American brain and enterprise will surpass the facings named. One of the difficulties I have to deal with is that I have to send to Columbus, Ohio, for facings, but this is not a great hardship, because I usually anticipate by appointment my cases in advance, sending a plaster cast of the jaw to be bridged, and thus secure proper shade and size of facings.

In using the Steele facing no porcelain is present when soldering, and consequently no checking and discoloration of facings can result; no unsightly gold tips and display of gold between facings, because they are almost uniform in width from incisal edge to neck. Bridges can be inserted immediately after extraction, and later, when absorption of the gums has taken place, the old facings can be replaced with larger ones without requiring the removal of the bridge. Time is thus saved in the construction of bridges, and if repairs are ever needed they can be made easily and quickly without removing the bridge.

During many years the cementation of crowns and bridges has been with me a subject of close study, and many times have I wished that I might, with ease, remove a crown or bridge. One of the causes, I may say, was the complaint, "Doctor, that bridge you set for me bothers me." One or two of the abutments would ache, or the patient reported a cap on one abutment loose, while the others were perfectly firm. To remove a bridge under such conditions, particularly if it contained one or two Richmond crowns, meant tremendous labor, and damage to a nicely constructed bridge. The conditions mentioned have confronted nearly every dentist, whether of limited or extensive experience, and he has seen many valuable abutments set up a severe pain or be altogether destroyed. So far as single crowns were concerned on anterior teeth, for many years I solved the difficulty of easy removal, because I employed gutta-percha, but bridges up to about three years ago I continued to set by using the ordinary cements. Three years ago I began using Evans' gutta-percha cement for setting bridges, using it cautiously at first, but now I use it almost altogether. As a result of my experience with this preparation, I now find myself in a position to easily and quickly remove a bridge, and this without slitting or destroying a single crown.

Patients should be thoroughly impressed with the necessity of having bridges examined at least twice a year, in order that if any imperfections exist they may be corrected by removal, which will give an opportunity for careful examination of each abutment, and the performance of such services as will best benefit the patient. This is a plan I now pursue in my practice. From a humane standpoint gutta-percha is to be preferred, because its effect on tooth-structure is soothing, and because it does not produce the violent pain the ordinary cements cause, lasting with some patients for hours.

My conception of a higher ideal in the branch under discussion is this: I feel convinced, for reasons already briefly stated, that a higher ideal in crown and bridge work can be attained if detachable and interchangeable facings and gutta-percha cement for cementation are used. I do not claim absolute perfection for the combinations named, but they are a long step in advance over the old methods.

Discussion.

Dr. H. C. Register, Philadelphia, Pa. I think the first part of the paper is of a character that is so old that it has almost passed away. Crown and bridge work, as he says, has undoubtedly come to stay. It is a necessity, and anything that fulfills a necessity is of permanent duration. There are, of course, a number of methods that are being used by different operators, and when we investigate these different methods we find that some of them are much better than others. In the first place the attachment of crowns and bridges is a feature of the work that necessarily needs to be very carefully considered. It is the keystone in the adjustment of artificial teeth to the human jaw. We should consider the bridge in all its relations, and likewise what it does for the individual. It restores a lost part prosthetically in a most artistic manner. The relation of such a substitute should be absolutely understood in all its bearings, prosthetical, physiological, and functional. All these conditions should be taken into account in connection with the work which we have to do, and without which we are not doing the best for our patients.

Dr. Burkhart did not refer at all to the pathological phase of the subject. He took us through the laboratory; he described the artistic changes brought about in the human face by correctly constructed bridges; that is all well enough; it goes without saying, but what about the pathology of the mouth? Unless we take into consideration the environment of the bridge, especially in regard to bacterial conditions, crown and bridge work is but a temporary prosthetic measure that will destroy its own purpose. Traumatism is one of the bugbears in all crown and bridge work today, because you create by the very act of inserting a mechanical contrivance in the mouth a traumatism that did not exist before. Now, you have to institute means to counteract the possible traumatic action of crowns and bridges, and when one resorts to ferrule crowns—as nine-tenths of the dentists are doing today, without understanding that they are destroying the teeth upon which they are adapted—the usefulness of the teeth must soon come to an end by reason of the injurious effects of the crowns upon the pericementum.

Dr. Burkhart calls our attention to materials. They should be the very best obtainable. There are great opportunities in this line of restoration of function. Think for a moment of what we are doing for an individual by restoring his dental organs. I speak feelingly, because I am a bridge-wearer, and I know what bridges have done for me. The bridges that I have in my own mouth have been of such an immense use to me that really, so far as the fees for doing the work are concerned, I know of no ordinary fee in the realm of minor surgery that I would have paid with a feeling of more thorough appreciation of what such services have meant to me.

The pathological phase of this work is not generally considered by dentists, and not at all by the people, and unless it is given ample consideration, unless you dwell upon it, and impress its importance upon laymen, the bridge or crown will be of but limited usefulness and duration. Germs—together with salivary calculi—are the great cause, the principal cause of all subsequent trouble. There is something still back of those etiological factors, namely, the predisposition of individuals to certain diseases. In the human economy every individual is an individual unto himself.

Dr. Burkhart has said one thing that is extremely good. He said that bridge work should be done for a purpose, and in my remarks in regard to the environmental idea I particularly laid stress on that point, namely, that when we make bridges or crowns we should bear in mind the purposes for which these appliances are intended.

In regard to the formation of crowns I am somewhat inclined to favor a method which I have followed for fully twenty years past. I make shell crowns, and then, after placing on the facings, fill them with rubber. After vulcanizing them, each of these crowns forms a little saddle unto itself, and after being united it results in a bridge in which these little saddles resting upon the gum prevent anything of a solid nature from finding lodgment under the piece, thus increasing the usefulness and longevity of the bridge by distributing the strain to one, two, or three teeth, according to the number used.

No man who wears a crown or a bridge should clean his teeth without using atomization. I have been an advocate of the atomizer before this society for fully thirty or more years, since I gave a demonstration before it of the use of the atomizer, and through all the experience that I have had during these years, I am still more convinced that the environment of the teeth can be very strongly influenced by germicidal washes used under strong atomization. I have also been an advocate and a striver for producing something that would be of such a character as to allow a bridge or a crown to be made so that the bridge could be constructed without the porcelain being united with it. I have been working on that thing for a number of years, and got very little encouragement, but I have no desire to depreciate the effort of Dr. Steele in regard to the Steele crown, but nine years ago last September I made application for a patent for just that crown. I gave a demonstration at Reading of the same thing before this society. I made application for a patent and withdrew it, concluding not to bother with patenting it, but to give it to the profession. As I say, I gave a demonstration of that crown before this society, and I also went to the Dental Protective

Manufacturing Company, and saw Mr. Morris of that concern (who made the teeth that I used in my demonstration), with the idea of manufacturing them. I bring this up, not to detract from Dr. Steele's work, but to show that it is not altogether an original device. I have a number of these teeth in my office, and I have the models that I demonstrated before this society at Reading some four or five years ago.

Dr. P. B. McCullough, Philadelphia, I approach the discussion of this paper with some trepidation, for the reason that after having spent several years studying problems in this department of prosthetic dentistry I am constrained to think that the present status of bridge work, as well as of the whole field of prosthetic dentistry, is regrettably primitive. Some parts have been well studied, but they are only units; more units, and then the aggregation of these units will constitute the *system* yet to be brought out. Too much of the synthetic and not enough of the analytic is what we have been having.

The introduction to the subject by the essayist is inspiring, but with the technique I am not in entire accord. The first operative consideration in bridging a bicuspid-molar space is the preparation of the abutments. This, to be scientific, must admit of a method positive, accurate, and mechanically correct. The method is not extant by which a molar crown can be prepared and enveloped with gold, and a mechanical joint made at or below the free margin of the gum. Assume the two abutments crowned. Two abutments bordering a space are never parallel, and therefore when these abutments are soldered to the bridge, if it goes to place the abutment crowns cannot fit the necks of their respective teeth. This can be overcome by making a lock-joint with the anterior abutment, so that the lug engages its socket when the molar crown is nearly in place. By this method any degree of inclination of the supporting teeth can be provided for, and the anchorage made mechanically as well as physiologically correct, as, by virtue of the limited play which this joint permits, the natural physiological independent mobility of the abutments is not impaired.

Regarding the contour which the dummy teeth should have, I will have to digress a moment to justify my position. Recently Dr. Charles K. Mills, an alienist, read a paper before the Academy of Stomatology on the subject of "Obsessions of Dental Origin," in which he reported several cases of mental derelicts whose histories commenced with consciousness of ill-fitting crowns or bridges. I would not have you understand it was because of these faults, real or imaginary, that these patients lost their reason, but I do believe it is our business to vie with nature in producing crowns and dummy teeth so ingenious in contour as to conceal art, and defy the tongue of the sane or insane to distinguish them. I would make the physician or the shoemaker suffer the burden of these histories.

Dr. J. A. Libbey, Pittsburg. In the opening of the essayist's paper I was glad to hear him admit that there was a necessity for careful work along this line. I do not believe there is any other branch of dentistry in which there has been more half-finished work done than in the line of crown and bridge work. I do not intend to discuss the paper fully, but I want to speak on one particular point, and that is the subject of the facing. I have found in my hands more success by the use of the ordinary rubber teeth, attached with rubber, using a narrow saddle, than I have in any other way. These are easier to repair, are less liable to fracture, and cover the point that is liable to crack in soldering, because the facings are prepared with a narrow saddle, and the teeth are afterward attached with rubber. In that way it is possible to carry out the lines suggested by the last speaker. You can arrange these teeth to imitate as closely as possible the conditions in the mouth, and in addition the saddle is much easier to keep clean than the ordinary bridge. From a pathological standpoint it fulfills all the requirements to which Dr. Register alluded.

Dr. W. H. Neall, Philadelphia. If the bridge should break, necessitating its being removed, do you not have to cut off these crowns and do the vulcanizing over?

Dr. LIBBEY. It is not necessary, as all our bridges are made removable.

Dr. NEALL. What cement do you use?

Dr. LIBBEY. Any good cement.

Dr. N. H. MYERS, Wilkesbarre. It was our custom for a number of years, where we had to crown a tooth having a large approximal cavity extending to or under the gum, to simply fill that cavity with the best cement obtainable, after preparing the cavity in the usual way, and then to insert a gold crown upon it. But a number of these patients came back to me, as well as to other practitioners, with the crowns or bridge loosened up, and after investigating the cause of the loosening, I discovered that it had been due primarily to the disintegration of the cement in the cavity. We should have used a good amalgam to fill such cavities. Do not fill the cavity to the occlusal surface, as two-thirds or three-fourths of the length of the cavity is sufficient; then prepare the tooth and shape it as desired. By adjusting a crown on a tooth of that kind it is not likely that the crown will loosen up, provided that it be properly adjusted to the tooth. Another point on which I wish to speak has been referred to by one of the previous speakers—the question of the banded root. I wish there was some possible way of obtaining the consensus of opinion of all the practitioners at this session as to whether it is better in crowning a tooth to band the root or not. Does the band add sufficient strength to the root to compensate for the unhygienic condition induced by its use?

Dr. B. F. PLACE, Norristown. I have been interested in crown and bridge work for some twenty years. About that time since I constructed my first bridge. It was not built on the principles that we follow today, but I conceived a plan of my own in its construction. It was a case of substituting two central incisors that had been knocked out by accident. I removed the crowns of the two laterals, and swung the centrals on them, and the hinge thus made lasted the patient for many years. As a matter of fact, I do not know but what the bridge is still in the mouth, as I have not seen the patient for a number of years. In making a crown or a bridge there is one thing that is necessary, namely, good abutments. I tell my patients that it is a fallacy to attempt the making of a bridge in the absence of good abutments. Another requirement is to construct a bridge so that the patient can keep it clean, hygienically clean, with as much ease as he could the natural teeth. I do not believe in swinging four or five teeth on a bridge between two others, because I hold that the strain is so great that it cannot last for any length of time without loosening the roots of the teeth to which it is fastened.

As to the Steele teeth, I have never tried them, but I have examined them very carefully, and I like the principle, and hope some day to be able to thoroughly test them. The breaking of teeth in bridge work has annoyed me considerably, and I was glad to hear the essayist confess that he has encountered the same difficulty. It requires great skill to make a bridge so that it will be permanent and useful to the patient.

Dr. BURKHART (closing the discussion). Dr. Register said that we are all familiar with the mechanical aspect of the paper. To a man of his experience it may be old, but there are dentists who have not been in practice so long as Dr. Register and to that class of men it is not old, and for this reason: There is scarcely a dentist in our larger cities who has not recognized the fact that of all the slovenly and indifferent work that is turned out, crown and bridge work is the most noticeable, and I have oftentimes thought that less honesty is displayed in this class of work than in any other. I regret to say it. It may be from lack of ability on the part of some; it may be indifference; but whatever it may be, the thought that has come to me in the years gone by is that it cannot be impressed too strongly on the young men coming into dentistry today that every step, conscientiously carried out, will increase their skill in this as well as in other branches. In the time to which the paper was limited I of course could not go into a general discussion of the pathological aspect of the subject, because I did not care to encroach upon your valuable time. I simply desired to dwell more particularly on its mechanical side, and in considering the mechanical, there will also with thoughtful men come consideration of the pathological aspect.

To digress for a moment, I regret that the question of cementation was not discussed here today, because I believe that of all things that enter into crown and bridge work the question of cementation is one which should receive greater attention than it has heretofore. The thoughts which appear in the paper are the outcome of actual experience, and are not "paper dentistry." Now I know this, that so far as single crowns are concerned I have had great satisfaction in the use of gutta-percha, and specially gratifying results from the use of this material in setting bridges. I have in mind a case in my own family, in which, I am satisfied, had I used gutta-percha cement in setting the bridge, I would have saved two abutments which would be doing good service today. It is frequently the case that crystal cements will disintegrate under one abutment while the others remain firm, and in that way one or more abutments may be lost, which could have been avoided had the method I suggested been followed. If there be a man here who has not had any experience with gutta-percha, I trust he will give it a trial.

One gentleman said that by the method described in the paper, abutments cannot be accurately prepared. Let me ask how many gentlemen here have ever attempted to prepare an abutment after the method which I described. Please raise your hands. I do not see a single hand. Now, if you never have used that method, go home and try it, and if I ever have the pleasure of meeting you again, you will confess that by that particular method you have obtained better results than in any other possible manner. After preparing the tooth with the disks that I have mentioned, knife-edged disks, you can next, by means of the sand-paper disks, polish and thus accomplish results that will astonish you. One gentleman says that the facings to which I have called your attention are defective at a point where I think they are better than pin facings, and the proportions better and more accurately suited and adapted for the work. I claim that the Steele interchangeable facings will give better and more artistic results than the ordinary pin-facings.

Dr. Myers asked a question about the use of the banded Richmond crown. I believe a Richmond crown should be constructed on a three-quarter cap, the cap being placed on all sides except the labial; it should be fitted accurately and closely to the gum margin. I may say this for those who may possibly try to use gutta-percha cement in setting a bridge with four abutments: First, place the gutta-percha in the shells and carry them to position while the crowns are moist. Then remove, and see whether you have enough gutta-percha. If you have not used a sufficient quantity more can be added, or if there be too much the excess can be trimmed off; then cleanse with alcohol, heat the bridge and try it again, and if this time there be a sufficient quantity of the gutta-percha in the shells, proceed in a similar manner with the caps of the Richmond crowns. Do not be too hasty in trying to set the bridge, lest it may burn the patient's mouth, but heat the bridge slowly according to directions given. After carefully drying the abutments, place a small quantity of the gutta-percha in the aperture of the roots on which the Richmond crowns will rest, and when the bridge is placed in the mouth, if the abutments are free from moisture, the gutta-percha in the caps and roots will unite. If for any reason the bridge does not suit you, in five minutes you can remove it, and this can be done just as readily six months or three years afterward.

In closing I would simply say that the method which I have described has been a source of much satisfaction to me in overcoming some of the defects, hardships, and disappointments which confronted me in my early practice in crown and bridge work.

(To be continued.)

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EDITORIAL DEPARTMENT.

ETHICS AND PROFESSIONAL PROGRESS.

WITH the opening of the various dental educational institutions throughout the land some thousands of young men, and some women as well, have entered upon the preparatory work leading toward a professional career. Of these the major proportion will issue finally as graduates and in due time become recruits in the great army of dental practitioners. The annual increment of new graduates to the dental professional ranks is perhaps the most important influence at work, because it is the most potent in bringing about that gradual evolution in the warp and woof of the professional texture which we call progress, or the advancement of the profession.

We would by no means ignore the many other factors tending toward the same result—the influence of our literature, of dental societies, or the efforts of individual workers—but anyone who has kept in touch with all of these influences for a generation must have been impressed with the fact that the faces he meets at dental conventions are for the most part new to him; the older members are a minority in number; those who prepare papers, give clinics, who do the major part of association work, are comparatively new men of the younger group, and not those who twenty-five years ago were most prominent in dental activities. The so-called leaders of the profession still lead in their respective spheres, but the great mass of work that characterizes the attitude and achievement of the profession is done by the younger men, and it is their work which determines the status of the profession in so far as its average standard is concerned.

When we consider the influence which the body of newly graduated men comes to exert at once upon professional progress, the tremendous importance of their proper training is evident. The fitness of the new graduate for professional life depends mainly upon two elements, viz, his individual character and his technical skill, using the latter phrase in its broadest signification to include his intellectual training in professional matters as well as his manual dexterity. The man who is possessed of those attributes of character that shape his conduct so as to make of him a worthy and acceptable social unit, and who adds thereto proper education in professional work, is destined not only to succeed as a practitioner but also to become the exponent of a higher professional progress as well. In nearly all that has been written and said concerning dental education these two phases of preparation needed to produce the best type of professional man are fully recognized; and as to the nature and make-up of the dental curriculum there is, on the whole, not very great divergence of opinion. The educational questions which, however, do give rise to the warmest discussion are upon those subjects which have really to do with character formation in the practitioner, those involving ethical factors and professional ideals. The need for improvement in these matters is frequently expressed in the demand that colleges should give lectures on ethics, should inculcate higher standards of professionalism, so as to avert the too frequent happening that the new graduate, armed with the certificate of his qualification as a professional man in the shape of a diploma conferring upon him the D.D.S. title, drifts or with malice prepense goes into quackery in the conduct of his calling. In the study of this question it is but fair to inquire into all the circumstances which have resulted in such an unfortunate result. It is easy enough for the unthinking to hold a dental college responsible when one of its graduates falls from grace, but it is by no means just to do so even though it be easy. As a matter of fact the proportion of graduates who fall into illegitimate or unethical methods is an extremely small one; yet the fact that quackery and unethical practices are indulged in by some holders of the college qualification remains a fact, and in order that this defect may be cured or prevented its causes should be first of all sought out and rectified.

We hold it to be a fundamental principle of belief and action in ethics that to know and do the right is productive of greater good to the individual than to do the wrong. In other words, honesty is the best policy for the reason that anything less than honesty is a poor policy regarded merely as a course of action in the absence of any higher motive. Ignorance of this fundamental principle or disbelief in it can be the only rational explanation for its neglect, especially from a selfish point of view, which is the view that leads the candidate for professional success to resort to illegitimate methods for its attainment. But knowledge of and belief in the principle referred to is rarely a natural endowment; generally it is reached only by actual experience of living; less frequently is it attained as the result of precept or teaching. As a consequence its recognition comes to individuals at varying periods of life, and to some never. Temperament, heredity, home influences, early training, social environment, all are factors influencing the development of the ethical sense and the understanding of the principles upon which it is based. The man who becomes an unethical practitioner after graduating is always one of that class in whom the ethical sense is still dormant in spite of all that the incidents of his college career have done toward arousing him to an intelligent appreciation of the fundamental principle that honesty is the best policy. He has escaped from the institution as he came into it, lacking the most elementary and essential element of a normal character—an element which should have been rooted in his life during the kindergarten stage and the absence of which constitutes a defect that the dental course was unable to rectify.

The case is fairly analogous to the failure of religious systems to purify all communities from the contamination of vice or crime, yet on the whole these influences for right living are great moral agencies in improving ethical standards in society as a whole, just as the dental college is constantly improving the ethical standards of the whole profession.

We have on a former occasion called attention in these pages to the ethical cultural value of precise and honest work in the laboratory aspect of the subjects which constitute the dental curriculum.* No teacher who is really that can fail to recognize the ethical value of such training. Constant contact with the unvarying accuracy and inevitable precision of Nature in her methods compels a respect for those same principles wherever manifested ; and the ethical sense of the observer is rapidly stimulated into active growth by such contact until the repeated experiences become fixed in character. The teacher of science or the teacher who in any department of human inquiry uses the scientific method in the exposition of his subject necessarily becomes an exponent of ethics *ex officio*, no matter how his particular branch may be designated. He creates a distrust for the illegitimate or irregular by exposing its weakness and error and by demonstrating that only the right and legitimate will attain the end sought.

In view of the immense ethical as well as practical utility of science teaching in the dental course, we are of the opinion that no department of the curriculum is of so great importance as that which forms its foundation, the so-called "theory" of the course. Every teacher of experience knows how difficult it is to convince a considerable proportion of a class of freshmen dental students that the subjects of chemistry, anatomy, physiology, and pathology are of great utility as preparation for dental practice. The subjects named are taken and passed by too many students only because they are required for the degree, not because of any real value which the student sees in them as training or for their actual utility. Such a misconception is not only fatal to the proper training of the future practitioner, but unless it be early eradicated becomes a potent factor in the creation later of an unethical practitioner ; first, because the student entirely misses the cultural results of a proper training in these subjects, and second, because he knows that his course is a fraudulent one, that he is not sympathetically receiving what he professes that he is receiving, and the fraudulent attitude becomes easily fixed in his later career as a practitioner.

The fault in this connection is not always with the student, but in many cases it lies with the teacher. In most cases the student comes directly from the preparatory school to the professional institution. His science teaching previously has been meager in quantity and too frequently poor in quality, and he is abruptly transported into contact with a variety and extent of science studies for which he is imperfectly prepared. As a consequence he is often discouraged and not infrequently overwhelmed with the belief that his task is too great for his powers. He becomes hopeless of succeeding by legitimate means, and the only alternative to his inexperienced mind is the illegitimate method of memorizing names and data with the hope of passing his "exams" by saying words about a subject of which he really knows nothing.

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* "Manual Training and Ethics," COSMOS, vol. xlvii, p. 513.

The successful treatment of these cases is the test of a teacher's fitness for his work, and of his right to the designation of teacher. He must not only know his subject but his pupil. He must realize that to illuminate the mind of the latter with a conception of the subject taught, it is necessary to connect the new idea with some previous conception which experience has stamped upon the mind of the pupil. Atoms, molecules, mass action, catalysis, osmosis, enzymes, and many other abstractions that are representative of long periods of evolution of scientific thought, are meaningless to the new recruit, because he knows nothing of the processes by which the conclusions these terms represent were wrought out in the minds that evolved them; and until his own mind has been somehow guided along the same channels they will simply be meaningless words and will remain so. Too much of teaching is merely a brain-stuffing process with the words about things, and study too often a word-memorizing process. The teacher who can teach in such a way as to enable the student to himself master the subject is the true teacher. The inability of so many students to appreciate the vital connection between what they denominate "theory" and the practical work of professional life is evidence of faulty teaching done by a so-called teacher who does not himself clearly apprehend or appreciate the connection.

Our plea is for a more sincere and earnest effort to improve the quality and method of teaching; for a realization that no higher responsibility or more noble profession exists than that of shaping the intellectual development and ideals of a coming generation, and that no one thing will do more to eradicate quackery and charlatanism, and all other symptoms of illegitimacy and dishonesty in professional life, than the successful inculcation of right-mindedness in the doing of the work of the dental college curriculum.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*La Odontología*, Madrid, August 1906.]

THE HEMOSTATIC PROPERTIES OF POTASSIUM PERMANGANATE. By Dr. Hans Voerner.

For arresting hemorrhage following minor surgical operations, Dr. Voerner employs potassium permanganate, either in solution, in powdered form, or as a paste. To obtain a fine powder two parts of the permanganate are mixed with one of powdered talc. The combination is then wetted, and after drying is re-pulverized. The paste is prepared by adding paraffin to the powder. To arrest a hemorrhage, the affected part is first freed of blood, débris, etc., and the permanganate is subsequently applied. Slight hemorrhages are arrested at once. To prevent the pain which follows the application of the agent the hemorrhagic area is previously treated with a cocain solution. Owing to the antiseptic properties of potassium permanganate, all danger of wound-infection is entirely eliminated.

[*La Odontología*, Madrid, August 1906.]

A CASE OF PERSISTENT POST-EXTRACTION HEMORRHAGE TREATED BY REIMPLANTATION. By Dr. Eduardo Zarvelo, Buenos Aires, Argentina.

The author relates the case of a boy, age fourteen, who presented himself at the hospital dental clinic conducted under his supervision, suffering from intense pain due to an alveolar abscess on the lower right first molar, which in all probability had been induced by caries of the fourth degree. The inflammatory process had spread considerably, as the cheeks had swelled to a voluminous size and the jaws were in tight contact with each other. Considering that the young patient was in the grip of most excruciating pain it was decided to remove the offending organ at once, and in this connection the author discusses the question of the advisability of extracting a tooth at the height of an inflammatory process, or *au chaud*. He believes, and we concur with his opinion, that the extraction of a diseased tooth is the logical procedure (other means of treatment having been exhausted), for by doing so the basal dictum of rational pathology is carried out. The tooth was removed and the post-extraction hemorrhage was intense and persistent. After having used all physical, chemical, and mechanical means ordinarily employed to arrest alveolar hemorrhage, without success, the author, after thoroughly sterilizing the extracted tooth in a bichlorid solution of suitable strength, reimplanted it, with the result that the hemorrhage soon ceased and twenty-five days after the intervention the tooth appeared solidly implanted in its alveolus.

[*Le Progrès Dentaire*, Paris, July 1906.]

A SIMPLE METHOD OF DIAGNOSING INCIPIENT STOMATITIS IN THE COURSE OF MERCURIAL TREATMENT. By Dr. Steverino.

The clinical signs indicative of toxic stomatitis and of more serious phenomena of organic intolerance to the action of mercurial compounds have already been carefully studied and described by Professor Fournier of the Faculty of Medicine of Paris. The sum of these manifestations constitutes that pathological condition which this distinguished writer deems proper to designate under the expressive term *stomatite d'alarme*. The symptoms of a *stomatite d'alarme* or *impending stomatitis* are: a strange taste in the mouth; teeth "on edge"; slight difficulty in mastication; strong and perceptible breath, though not fetid; recession of the gum over the second molars on either side of the mouth, and in some cases likewise of the gum over the lower incisors; painful response to pressure applied against these teeth, and a reddish striation of the gum overlying the same teeth. If upon the onset of these symptoms the mercurial treatment be not interrupted, more intense and painful phenomena of stomatitis will appear, and perhaps clinical signs of intense intoxication; and consequently when the administration of mercury is temporarily suspended it will not be possible to resume it until after a much longer period, thus incurring the risk of the specific process making a much stronger impress upon the affected organs, which in some instances are the most delicate and vital ones of the whole economy.

The symptoms of incipient stomatitis are not often noticed by the attending physician or the patient, and therefore the plan suggested by Dr. Steverino is certainly called upon to render most valuable help in the therapeusis of syphilis. His method of detecting the pathologic state under discussion consists in applying fresh tincture of iodin by means of a pellet of cotton upon the labial surfaces of the lower incisors and canines, directing the patient to at once wet the teeth so treated with saliva. After one-half minute, if the reaction be positive, it will be observed that the teeth which were touched with the iodin pellet will present a pinkish appearance of variable degree of intensity. In order to facilitate detection of the change in color on the teeth it is absolutely necessary that the latter should be as clean as possible, as it may be otherwise difficult to detect the pink shade upon them if the reaction be but slightly marked. The pink color does not appear on the teeth of patients who keep their mouths and teeth scrupulously clean and whose excretory organs are in normal working condition. If the reaction be marked, the stage of intolerance to the effects of mercury has been reached. If the test be applied to the teeth of patients already suffering from so-called mercurial stomatitis the reaction will be well marked, but the special *raison d'être* of the foregoing method is to detect an incipient stomatitis and the beginning of the stage of intolerance to the drug, in order that the practitioner may be enabled to suspend the mercurial treatment or to insist upon a more strict hygienic care of the mouth, or both. This test is applicable to all cases of mercurial medication, regardless of the form in which the agent is administered or of the route through which it gains entrance into the body.

While it is a comparatively easy matter to explain the production of the pinkish coloration upon the teeth by the action of the iodin upon the mercury eliminated in the saliva, producing the red mercuric iodid, it is by no means clear to the author why this reaction should not occur in all cases in which mercury is continuously administered, in view of the fact that the agent is invariably eliminated in part in the salivary fluid. The reaction occurs only in cases of intolerance to the action of the drug. It may, however, be said in explanation of the phenomenon, that under normal conditions when the excretory action of the kidneys is active the proportion of mercury eliminated in the saliva is very small—indeed, so small that the reaction, which apparently is not an intensely delicate one, does not take place. If through excessive mercurial administration the tissues become saturated, or if for any reason whatever the renal filter become less active, the proportion of mercury eliminated through the saliva will be much greater, and its presence will be detected by the iodin reaction long before it has brought about such changes in the mucous membrane as to invite and facilitate the propagation of the bacterial elements responsible for the inflammatory phenomena which later on become manifest.

[*Archives de Stomatologie*, Paris, July 1906.]

A CONTRIBUTION TO THE STUDY OF BLACK TONGUE. By Dr. Urbano Melzi, Milan.

The pathology of black tongue (*Haarzunge*, melanotrichia linguæ) is as yet exceedingly obscure. Amatus Lucitanus, in a work published in 1557 entitled "Curationum medicalium medici physici praestantissimi centuriæ quatuor;" etc., refers to sixty-five cases of individuals presenting hairy tongues. It is not possible to state with certainty whether the growths were of the true hairy type; if such was the case the abnormality was of embryonal origin.

According to Rosenthal, who has described this disease in detail, the term black tongue implies a symmetrical coloration of the tongue upon that portion of the organ anterior to the calciform papillæ; it is seldom that the coloration is not symmetrical or localized in the region of the organ already mentioned. The coloration is not uniform; it varies in intensity and appearance. However, as in the majority of cases that have been described the tongue presented a blackish appearance, the term black tongue has been given to the disease. In some cases the organ has a yellowish appearance (Dinkler), in others brownish or greenish. The colored portion of the upper surface of the organ (the margins and the tip of the organ always remain unaffected) may be either oval, round, or triangular in shape; it should be noted, however, that the transition from the diseased to the healthy areas is not well marked; it takes place in a gradual way. In some cases the surface is smooth, in others it presents a velvety appearance due to a thickening and lengthening of the filiform papillæ. Occasionally the lengthening of the papillæ amounts to five millimeters and over. In a case described by Reinecke the lengthening of the papillæ was over one centimeter (⅖ inch). The direction of the lengthened papillæ is from before backward, and they are clearly perceptible when the tongue is rubbed in the opposite direction. The cause of the color which the organ assumes when it is the seat of melanotrichia linguæ has been attributed by the early writers and also by some moderns to the presence of several vegetable parasites, among them a fungus of the genus Mucor: *Mucor niger* would seem to play an important rôle, as its conidiæ (the reproductive cells of the mycelium) have spores enveloped by a black membrane. This fungus has been isolated and cultivated upon several occasions, and in each case produced blackish-looking colonies. Schmiegelow isolated and cultivated a black fungus of the class Hyphomycetes, which he considered to be the cause of the black appearance of the tongue. However, Roth admits that the ordinary fungi that are found in great numbers in the mouth can of themselves cause the coloration and lengthening of the filiform papillæ.

Notwithstanding the foregoing investigations, it cannot as yet be said that black tongue is caused by any one of the before-named organisms, inasmuch as in several typical instances of the disease not any one of them was found in the mouth. The views advanced by Brosin, Moureck, and Schech seem more acceptable; in their opinion the great development of the epithelial cells occurs simultaneously with an exaggerated production of the pigment to be found in keratinized cells. Wollmer likewise considers the affection in the light of a hyperkeratosis of the lingual mucous membrane. Moureck does not consider that the disease is of parasitic origin, but that it is from the beginning a hypertrophic process; while Chevalier is of the opinion that the etiologic factor is to be found in a trophic disorder localized in the epithelium of the filiform papillæ of the tongue.

In the great majority of cases the discomfort caused by black tongue is practically *nil;* in some cases the patients complain of a sensation of swelling about the tongue, of a diminution in the sense of taste, and occasionally of offensive breath; a few patients complain of that excessive dryness of the mucous membrane and of the faucial pruritus which gives rise to nausea. It is, however, more often the case that patients discover the affection accidentally by observing in a mirror the peculiar color of the tongue. The disease may last from a few days to several years, and while usually its intensity remains stationary, in some cases it at times appears temporarily aggravated.

The predisposing factors to the disease are irritation of the mucous membrane, especially that type due to tobacco smoke, gastro-intestinal troubles, exaggerated acidity of the saliva, diabetes, scarlatina, or trophic troubles either of central or of general origin. It is not rare to observe the disease in its acute form among syphilitics. The diagnosis is easily made on account of the thickened and lengthened filiform papillæ; it cannot be readily confounded with the lingual manifestations of Addison's disease characterized by the presence of brownish vesicles on the upper surface of the tongue.

Regarding the treatment, the author states that in cases in which the patient does not suffer from any discomforting manifestation it is better not to interfere, while if the conditions be otherwise he advises the scraping of the tongue to remove the pasty covering found upon it, then cauterizing the hypertrophied papillæ. Several authors, Unna among them, advise the painting of the diseased area with a 5 per cent. ethereal solution of salicylic acid, or with a 10 per cent. solution of resorcin in the same vehicle. In all cases, however, a systematic and careful disinfection of the mouth is indispensable. In concluding, the author reports a case in his own practice which he treated successfully with daily applications of a solution of hydrogen dioxid and sodium borate of suitable strength.

[*Revue Internationale de Prothèse Dentaire,* Paris, June 1906.]

HEMOSTATIC MIXTURE.

Pharmaceutische Zeitung recommends the following hemostatic mixture:

℞—Sulfo-phenic acid,	℥jss;
Rectified alcohol,	℥jss;
Benzoic acid,	ʒj;
Tannic acid,	ʒj;
Glycerin,	℥jss;
Rose-water,	℥vij. M.

The sulfo-phenic acid is prepared by mixing one part of sulfuric acid with one-half part of carbolic acid and heating for several minutes in a bain-marie or water-bath. The benzoic acid is dissolved in a portion of the alcohol and the glycerin, and the tannic acid in the remainder of the alcohol. The mixture is clear, of a straw-color, acid in taste, caustic, but not irritating, and coagulates albumin.

[*Transactions of the Odontological Society of Great Britain,* London, April 1906.]

HYPERTROPHY OF THE GUMS. By Mr. E. J. M. Phillips, M.R.C.S., L.R.C.P., L.D.S.

Previous history. Twelve years ago the patient, a female aged twenty, noticed a swelling in the region of the alveolus of the upper right maxilla, which was painless.

About this time there were several alveolar abscesses, and the swelling increased. She then saw a physician, who advised extraction of the upper and lower first molars. However, she visited a druggist, who gave her a mouth-wash. The enlargement of the growth did not respond to this treatment. As a result she neglected further advice, and the gums increased in size; later she underwent medical treatment, also of no avail. Previous to the operation, X rays and treatment with iodin were tried, but only slightly affected the mass beneficially.

Three years ago the mass of tissue was freely removed, and the exposed surfaces cauterized. No recurrence or further trouble took place until six months ago, when the growth of the gums became more rapid, but never painful.

Inspection of the mouth revealed large masses of hypertrophied tissue, freely movable, and bleeding easily when brushed. The teeth were all loose, but there were no evidences of pyorrhea alveolaris. An upper incisor and a lower second molar were septic; otherwise her teeth were clean and in excellent condition, caries being practically absent.

Histories of syphilis, mercury, and phosphorus were excluded. Parents were both healthy; brothers and sisters all perfectly healthy; nails and hair quite normal, and intellect good.

An operation has now been performed, consisting of the removal of the gum tissue, teeth, and alveolar processes.

[*Revue Internationale de Prothèse Dentaire,* Paris, August 1906.]

A TOOTH-POWDER. By Dr. Hugenschmidt.

The author recommends the following formula in a recent issue of *L'Union Pharmaceutique:*

℞—Menthol,	gr. vij;
Salol,	ʒij;
Castile soap,	ʒv;
Calcium carbonate,	ʒv;
Magnesium carbonate,	℥i;
Oil of peppermint,	gr. xv. M.

Sig.—If salivary calculi be present in large quantities there should be added to the formula from two to five drams of powdered pumice-stone.

[*Revue Internationale de Prothèse Dentaire,* Paris, August 1906.]

DEATH OF AN INFANT FOLLOWING THE EXTRACTION OF A CONGENITAL TOOTH. By Dr. Jules Simon.

The author reports the case of an infant born with a fully developed central incisor, which at the advice of the attending physician it was decided to extract, as it seemed to interfere with the nursing process. The tooth was removed, and the little alveolus was dried with a pellet of cotton. Two hours afterward an intense hemorrhage took place, which persisting—notwithstanding all the means employed by the physician—in a short time caused the death of the little sufferer

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PERISCOPE.

To Hold Cotton on Smooth Broach.—In order to hold cotton on a smooth broach, rub a little wax on the broach, warm slightly, and wrap on the desired amount of cotton.—H. L. Entriken, *Western Dental Journal.*

The Use of Talc Supports in the Fusing of Porcelain.—"Talc," the commercial form of boiler makers' crayons, obtainable in heavy hardware stores, is useful as supports for porcelain work in the furnace. It may be carved to any form desired, and withstands heat perfectly.—Goodman A. Miller, *Bur.*

Twisting Ligatures.—Wire ligatures should first be drawn tightly with the hands and then twisted. If the attempt is made to tighten by twisting only, the wire will break before any tension to speak of is attained.—*Western Dental Journal.*

Thymol in the Treatment of Abscesses.—Thymol is very unsoluble under ordinary circumstances, but it dissolves in oil of eucalyptus, when it becomes a valuable agent in the treatment, especially of the mild forms of chronic blind abscesses.—Geo. W. Cook, *Western Dental Journal.*

Painless Application of Corrosive Sublimate.—L. F. Appleman (*American Medicine*) states that when solutions of mercury bichlorid are made with normal salt solution instead of water, they do not cause the slightest pain when applied to the mucous membranes.—*Denver Medical Times.*

Upper Protrusion of Deciduous Teeth.—It is not often that we see a case of marked upper protrusion of the deciduous teeth; yet I have seen several such cases where there was no history of thumb-sucking, enlarged tonsils, or other mechanical cause, but where upper protrusion of the permanent incisors was present in quite a large number of the children's relatives, justifying the conclusion that these cases were inherited rather than acquired.—Wm. Matthews, *Dental Record.*

Worn Mandrels.—If a mandrel become so rusted or worn that the screw no longer holds, a light blow with the hammer will flatten the hole slightly, and cause the threads to hold as well as ever.—A. C. Willman, *Dental Review.*

A Guide in Punching Holes in Backings.—To accurately punch holes in backings, take a small piece of paper and slip over the pins of the facing, trimming to the size you wish the backing to be. Remove this pattern and place on plate, punching to correspond with the holes in the paper.—R. L. Hesser, *Dental Summary.*

To Polish Rubber Plates.—In giving the final polish to rubber plates, I find that a polishing wheel made of about twenty-five thicknesses of unbleached muslin gives a better finish than chamois skin or a soft brush-wheel. The edges of the circles of cloth become frayed and do not scratch.—A. C. Willman, *American Dental Journal.*

The Finishing of Gutta-Percha Fillings.—Gutta-percha fillings should be finished with flat burnishers so shaped as to reach all margins. The instruments should be heated sufficiently to cut the gutta-percha, but not to burn it. The material should be finished to the cavity margin and not pulled away from it.—W. O. Talbot, *Dental Headlight.*

Burnish your Gold Fillings.—The burnisher in its many forms is necessary in finishing gold fillings, which should always be well burnished over the entire surface, giving special care to the margins of the filling. The burnisher should always be used in finishing amalgam fillings as well as one can before the amalgam has thoroughly set, but not after, as there is danger of breaking the edges of the filling, or roughening the margins of the cavity by breaking off a few enamel rods. The right and left thin curved burnishers should be used on approximal fillings.—W. O. Talbot, *Dental Headlight.*

To Prepare the Floor of the Cap for a Porcelain Crown.—Puncture the floor of the cap from the root side with a pointed three-cornered instrument. A puncture thus made turns up a bur on the porcelain side, which becomes firmly embedded in the body of the piece and is fully as retentive as a headed pin in the facing.—L. A. Arnold, *Dental Review.*

Hasten the Setting of Impression Plates.—To neglect to add a pinch of salt, or something else as effective and harmless to hasten setting, is little short of a crime against the patient. If the specially prepared impression plaster be used this is perhaps unnecessary, but the regular model plaster seems to serve the purpose equally as well if salt be used.—C. L. White, *Western Dental Journal.*

To Remove Coating from Instruments after Boiling.—The coating which sometimes forms on instruments when boiling may be removed with the following solution:

Prepared chalk,	2 oz.
Ammonia,	2 "
Alcohol,	2 "
Water,	4 "

Rub the instruments with a cloth saturated with the solution, then wipe them with a dry cloth.—J. Q. Byram, *Dental Review.*

The Desiderata of a Correctly Inserted Filling.—In a properly formed filling there are four points to be attained: The preservation of the full mesio-distal diameter of the tooth, a correct form of the approximal surface; a correct form of the interproximal contact, and the health of the gum septum. These points should be given not only to gold and amalgam fillings, but also to gold or porcelain inlays, as well as to all crowns, for the comfort and utility of each are alike dependent upon the form given. Upon this form we must depend in order to restore all parts to normal conditions of health and utility.—J. F. Wallace, *Dental Era.*

Hydronaphthol in Dental Operations.—I have from time to time noticed, in the cleaning out of a cavity preparatory to filling, that we come across, over the pulp-chamber, a layer of softened dentin, which if removed would necessitate the treatment, and probably the removal, of the pulp. I find that by using in equal quantities hydronaphthol and cement (in the ordinary way of mixing cement for a filling), and placing a capping of the same over the layer of dentin, then allowing it to become set and proceeding with my filling in the usual manner, my patient has no further trouble. The hydronaphthol preserves the teeth by arresting the action of putrefactive germs. The same applies in the case of a deciduous tooth, very little or no cleaning of the cavity being necessary, simply cap the cavity with hydronaphthol and cement and place your filling on the capping to obtain the necessary firmness. This applies also in the case of a hurried filling where the patient cannot spare time for proper treatment. Again, when I find it necessary to extract the pulp, and the patient has probably to leave the same day, after dressing and cleaning out the root-canal as well as possible in my limited time, I have filled the canal with a mixture of hydronaphthol and cement, and proceeded with the filling. In no instance has there been further trouble.—A. W. McCall, *Federal Dental Journal.*

A Method of Securing a Better Surface for the Attachment of Cement to Solid Gold Inlay.—This is a very simple but effective method of securing a better attachment of cement to a solid gold inlay: Sharpen a straight gold plugger to a needle point, then insert it in the engine mallet, and run it at high speed, with a good powerful blow, directing the point at different angles on the cavity surface of inlay. This will give a perfectly serrated surface, and the procedure is accomplished in less than three minutes. The inlay may be securely held on the end of a stick by the left hand, with one end of the stick resting on the body.—G. S. Hershey, *Bur.*

Gold Inlays: Their Application and Construction.—There are several reasons, which I will try to enumerate, for the preference for gold inlays over porcelain in all teeth posterior to the first premolar.

First: *Cavity preparation.* It is easier to prepare a perfectly safe cavity for a gold inlay than for porcelain, because a thinner body of gold may be exposed to stress in the former than would be possible with porcelain.

Second: *Margins.* The weakest point of a porcelain inlay lies in its margins, and where exposed to strain, as in a molar, they are almost sure to suffer, while the margins as prepared for a gold inlay are protected by the inlay itself, and never become even exposed.

Third: *Strength in resisting molar motion.* While I do not believe this is of as great importance as the others, believing as I do that a well-made and properly inserted porcelain inlay would have all necessary strength, yet it goes without saying that a gold inlay is the stronger.—F. R. Henshaw, *Dental Summary.*

Oil of Cajuput.—Dr. Arthur Matteson, many years ago, told us about the use of this agent in connection with gutta-percha. In placing a temporary stopping in a shallow or saucer-shaped cavity, if the latter be moistened with oil of cajuput, warm gutta-percha will adhere to it with special tenacity. It is also an excellent root-canal dressing previous to filling with the gutta-percha cone—better for either of these purposes, I think, than the oil of eucalyptus, and possessed of equal antiseptic properties.—GARRETT NEWKIRK, *Dental Review.*

To Give your Work a Smooth Finish: Care of the Enamel Margins.—The enamel prisms play an important part in the success of operative work in both vital and non-vital teeth. The prism terminals should receive a smooth proper bevel in different parts of the cavity, so that the filling and tooth be made harmonious as a whole. Never leave an enamel wall finished by a coarse bur, but use a finishing bur, and where possible, an Arkansas oil stone and the porte-polisher with pumice. Inquiry has shown that there is about one finishing bur sold to over a gross of cavity burs. Comment is unnecessary.—*Tri-State Dental Record.*

Method of Sterilizing Instruments and Appliances.—Immediately after use all instruments should be wiped, and then sterilized. The process of boiling is inconvenient in many ways, and bad for the instruments, even though a small quantity of soda be added to the water, and I think that immersion in an antiseptic solution is to be preferred. The instruments should be wholly immersed—not merely the points. One is much more likely to infect a crack at the commissure of the lips with the handle of an instrument than to infect the mouth with the point, the surface being larger and capable of conveying a larger dose of infection. After remaining immersed for some minutes each instrument must be carefully wiped with a clean cloth kept for the purpose: this mechanical cleansing is of the greatest importance, and without it a very much longer immersion is necessary. It is convenient to keep a separate tray for small instruments, such as burs, clamps, stones, etc. These small things should be cleansed with a wire brush kept in the solution.

The antiseptic which I prefer is lysoform—a combination of soap and formaldehyd. It is odorless, except for the faint odor of formaldehyd, and does not rust instruments, which may be left in it for any length of time, and will remain quite bright, with occasional exceptions, when rust appears in one or two small patches, due, possibly, to some electrical action. Mixed with water it makes an opalescent solution, so that for small objects it is advisable to have a shallow layer of fluid or they are lost to view. If these precautions are carried out, I believe that our patients will be at least as safe from infection in our chairs as at their own dinner tables.

The handpiece should be carefully wiped with the antiseptic. The wet syringe and blower should both be immersed. The chip-blower may have its point left out so that it keeps dry inside; this part will be sterilized in the flame when it is warmed previous to use.—J. H. BADCOCK, *British Dental Journal.*

Pyorrhea Alveolaris Treated with Common Salt.—In a case which had resisted treatment for a great many years, after the loss of many teeth a cure was effected through the use of common salt worked down into the pockets several times a day, salt being also used on the tooth-brush. The gums became solid and healthy and recession stopped. The loose teeth became so firm that they were used as supports for a bridge.—E. H. ALLEN, *Dental Review.*

[The use of common salt in the treatment of atony and inflammation of the gums, and as a general oral prophylactic agent, has been advocated by many practitioners, and Dr. P. B. McCollough of Philadelphia, who has been employing this agent for upward of ten years, reports results as satisfactory as those here recorded by Dr. Allen.—ED.]

How to Take a Bite that Must be Correct.—Nervous people are unable to close their teeth twice alike. If you wish to articulate a gold crown only, it is hard to have the patient articulate correctly. In full dentures it is almost impossible to get the right bite, as most patients will throw their lower jaw forward.

My way of taking the bite is as follows: Put your patient in a comfortable position, just as when you wish to converse with him. Prepare a trial plate in the ordinary manner with a piece of warm wax upon it. At the heel of the plate put a clutch made of wax. Tell your patient to put the tip of the tongue within this clutch and close the lips. The patient is unable to throw the lower jaw forward or sideways. The reason I ask him to close the lips is because when a patient needs a full upper and lower set of artificial teeth, he has no teeth to close, and by closing the lips he is not so apt to protrude the mandible in case he lifts the tongue out of the clutch.—RICHARD KESSEL, *Items of Interest.*

Gold Trimmers.—Gold trimmers for cutting the gold even with the margins of the cavity are the most valuable instruments in finishing gold fillings. The two trimmers designed by Dr. Frank D. Gardiner, the two by Dr. Gordon White, and the two by Dr. E. K. Wedelstaedt, together with a large discoid excavator to be used on occlusal margins, make a most perfect set. These instruments should be kept perfectly sharp, and the push and pull motion used in trimming should be applied longitudinally to the line of the cavity margin. The advantages of these instruments are that a filling can be trimmed accurately and rapidly without injuring the filling or tooth-structure, without lacerating the gum, and without heating the filling. They can be used the same on hardened amalgam fillings as on gold.—W. O. TALBOT, *Dental Headlight.*

How to Secure a Correct Impression.—Our first care in securing a good impression is in regard to the patient's mouth. All deposits and foreign particles must be removed, and the teeth thoroughly cleansed. A suitable tray is then selected and bent to fit the mouth accurately, leaving sufficient space in every direction for a good thickness of plaster. With the patient's mouth in readiness, and the tray in a convenient position for filling, we proceed to mix the plaster, using distilled water about 70°. The plaster which you have found by experience best suited for the work is then slowly sifted into the water with little or no stirring. When the last particle has disappeared below the surface of the water, the surplus is poured off and the plaster is ready for the impression. The grooves of the tray are then filled. Should the impression be an upper one, the roof of the tray receives no plaster at all. Placing the tray where it may be readily reached we proceed to fill the buccal and labial spaces, using a bone spatula to insure ease of application and cleanliness. When the plaster has been carefully worked under the cheeks and lips, and all the air expelled, we place the tray firmly in position. Sufficient time is then given for the plaster to harden before the tray is removed. At this stage many fail, being tempted to remove the impression too soon.

Every particle of softened and broken plaster is now removed with the aid of pliers and rolls of cotton. Grooves are then cut in the canine region, and the plaster carefully prized from its position, using care to apply the force in such direction that the impression of the interdental spaces will not be broken from the main portions. As the pieces are removed, they are set in order upon a clean blotter bearing the patient's name. When sufficiently dry the pieces are accurately placed in position, not, however, until the edges have been carefully dusted with a camel's-hair brush. The small pieces are first united to the larger by the aid of a celluloid cement, then the whole impression is assembled. In spite of the utmost care, we sometimes find it necessary to retouch the impression. A porous spot, an air-bubble, or it may be the line of fracture is too apparent. These slight defects are better corrected in the impression, and, if nicely done, not only improve the cast but render subsequent carving unnecessary. It is fine work, and must be done with care and skill, much the same as a negative would be treated. In fact, the camel's-hair pencil used by the photographer is admirably suited for this work. The pencil is thoroughly wetted in clean water, and upon its point a small particle of plaster is carried to the marred surface, which is carefully painted; the water sinking into the dry surface of the impression carries the plaster with it. When this work is done as it should be the surface of the impression is not changed in the slightest, but the defects are nicely obliterated. It must not be supposed that this method may be used for building up impressions or supplying lost pieces, as its mission is abused when it is so used. ALFRED P. ROGERS, *Items of Interest.*

Melting-point of Gold.—In a recent issue of *Archives des Sciences Physiques et Naturelles,* Messrs. Jacquerod and Perrot record their investigations on the melting-point of gold and the expansion of some gases between 0° and 1000° C. The thermometer used was a gas thermometer, in which the glass bulb was replaced by a bulb of silica soldered to a capillary tube—likewise made of silica, this being a very refractory material whose expansion is about twenty times less than that of platinum—connected with the manometer. If a piece of gold wire be placed beside the bulb in an electrically heated furnace, and closed in an alternating electric circuit including a telephone, the latter will cease vibrating at the moment of melting. According to these experiments, the melting-point of gold on the nitrogen thermometer scale (with constant volume) would be in the neighborhood of 1067° C. On the other hand, it is shown that the average co-efficients of expansion of nitrogen, oxygen, air, and carbon monoxid between 0° and 1000° C. may be taken as identical, whereas the co-efficient of carbonic acid is somewhat less than its value between 0° and 100° C. These experiments are to be repeated with helium thermometers.—*Scient. American.*

Principles Governing the Finishing of Fillings.—Some of the basic principles governing the finishing of fillings are that—

(a) The normal shape and contour of the tooth should be copied in the filling.

(b) All surfaces should be left with a smooth polish.

(c) The filling should not overlap the margins of the cavity.

(d) Cavities should be left entirely full.

(e) No distinct or acute angles should be left at the margin of any filling.

(f) The margin of a perfectly finished filling is not detected by passing the point of a sharp explorer over it.

(g) The occlusion to morsal fillings should be carved or ground to fit the antagonizing teeth.—W. O. Talbot, *Dental Headlight.*

Cement Linings with Amalgam Fillings.—There are many cases where a lining of cement is desirable when amalgam is to follow, and especially where the loss of dentin leaves a section of translucent enamel, which would show blue with the amalgam immediately in contact. One very satisfactory way to proceed is to cover the cavity walls with cement, and then having amalgam mixed and ready, crowd it in in a way to force out the surplus cement, finally clearing the margins of cement so that the finished filling shows no line of cement exposed. This might not inaptly be called an amalgam inlay, and would not be a bad idea to apply in nearly all cases where amalgam is to be used. If painstakingly done, the method is ideal. It should be done with some rapidity to be able to force out surplus cement, and especially at obscure margins before crystallization begins.—R. B. Tuller, *Amer. Dental Journal.*

Invisible Joints in Gum-Teeth Dentures.—The following is a method by which the joints can be made invisible while in the mouth. The method begins when the case is invested in the first half of the flask, and the plaster investment should only come to the wax border of the plate, in no case extending on to the wax:

Cut strips of tin foil No. 40 for each joint, making them one-fourth of an inch wide, and one and one-half inches long, and lay them over the joints, beginning on the labial surface of the front joint one-fourth of an inch below the porcelain, and lapping the end over the cutting edge of the incisors on to the palatal surface of the wax. Burnish the foil well on to the teeth and over the joints. After each joint is so protected, pour the opposite side of the flask. Heat the flask in boiling water for three minutes and separate. Remove the wax, which will expose both ends of all the foil strips. Mix a thin cement and place on the lingual surface of each joint; press the ends of the foil over the cement and joint. Pack and vulcanize as usual, and on the removal of the case from the flask, thoroughly wash and dry. Then remove the tin foil, and the joints will be just as clear from coloring matter as they were when assembled on the articulator. Dry the joints and slightly warm them, and with the wax spatula drop some hot wax into and over each joint. This will protect them better from dirt while finishing than would the foil.—R. E. Pretty, *Dentist's Magazine.*

Mixing Amalgam on Glazed Paper.—It is my conviction that the mixing of amalgam in the hand is unscientific and unclean. I cannot see how anyone can expect to get good results from such a procedure, incorporating sebaceous matter and bits of cuticle into a filling for a tooth. Take your knife-blade, scrape the palm of the hand with it and you will see what enters into your filling. Try mixing your amalgam with a stiff steel spatula on glazed paper. Begin with the mortar mix, then transfer it to the paper, and with the spatula triturate it thoroughly by placing the spatula on the mass and drawing it toward you. Mix in this manner three or four times, using a clean place on the paper each time, and by this means the amalgam will also be made clean.—H. N. Jackson, *Dental Review.*

How to Avoid Porosity in Vulcanite.—A great deal has been written and said in regard to the porosity of rubber. This happens when the escape of gas is retarded or prevented in certain places. It may take place when the heat was applied rapidly or unevenly, or when it was not equally distributed to all parts of the rubber. In the latter case, such parts as are more exposed to the radiating heat than others become hard much sooner because the hydrogen escapes quicker. In the former case—that is, by rapid increase of heat—the outer surface of the rubber hardens sooner than the inner, to which the heat only reaches gradually. Rubber, as is well known, is the poorest of conductors. It is clear, therefore, that the thicker a piece is, the longer it takes to become heated in all parts, and the more gradual must be the heating in order that an even hardening—or rather an even drying—of the mass may take place, so as not to produce a hardened outer rim when the inner substance is yet soft, *i.e.* contains more hydrogen. The hydrogen, which is becoming rarefied by the increase of heat, has not the power to force itself through the hardened parts; it, however, possesses a considerable power of expansion, which increases by constant application of heat; therefore it forms a cavity for itself, in which the yet unhardened rubber deposits its hydrogen so long as it escapes from the rubber, and until it is free from it and becomes hard.—F. ALB. BOECK, *Dental Era.*

Easy Method of Backing.—One of the most important items in crown and bridge work is that your backing fit the tooth perfectly, especially in the case of porcelain-faced crowns. How many of us have spent a quarter of an hour in burnishing a backing, and then found that it was far from being a fit? By a very simple device I have found that both time and patience can be saved.

Having ground the tooth at the back to the desired shape—which is invariably oval—take your Melotte's moldine and tray, dust the tooth with French chalk, and press it firmly into the moldine; draw away the tooth, and you will have an impress of tooth with the pinholes left by the pins. Take two pieces of steel, iron, or copper wire of about the same gage as the platinum pins, and insert them into the holes left by the pins of the tooth; pour the fusible metal; when set, draw away the die and you have a tooth-back with pins in position. Dust with French chalk and take the counter-die. You can now strike up the backing with no fear of breaking the tooth. By this method—which does not take more than three minutes—you secure a perfect backing, and it will only take one-third the time that it takes to bend up and burnish. —W. B. R., *Elliott's Quarterly.*

How to Take Partial Impressions.—Taking plaster as the only reliable material for any impression, particularly a partial one, I adopted the plan of taking all partials first in wax, using a perfectly flat cup, bringing the wax up between vacant spaces with the finger after the cup has been pressed to place; remove and chill the wax, then with a hot knife cut the entire labial and buccal wax away in front of or outside of any of the teeth; also cut the wax partly away where it laps the gum in vacant spaces from the side next the gum. Cut the wax out where impression of all the teeth is left, and then with an old excavator punch the wax full of indentations wherever the plaster covers the wax. Place plaster over the wax, with the spatula drag the plaster into the roof, and carry the cup—which will find its own way by reason of the wax—to place. Remove as soon as the plaster left in the bowl will break with a clean fracture. The impression will break where the plaster drags. Save the pieces and replace in their respective positions on the wax; tack to place with hot wax, and a most perfect impression will be secured. Any material which will bind rather than break will not secure a perfect impression, therefore plaster is to be preferred. One flat cup for the upper and one for the lower will take most partial impressions.—D. T. HILL, *Dental Summary.*

Backing Teeth.—In backing teeth, too much care cannot be expended in producing as good a fit as possible. The pinholes in the metal should not be enlarged unnecessarily, as this is often the cause of a tooth cracking in the firing, owing to the solder running through between the tooth and the backing. The metal should always be kept flush with the edges of the tooth all around. This is most essential in bridge work, as backings have often to be relied upon for linking up. Another point in favor of the metal being flush is, that in the mouth, should the incisive edges of a natural and an artificial tooth meet, there is less chance of fracture, since the backing undoubtedly takes up a certain amount of the strain. On the other hand, where there is a margin of metal almost an eighth of an inch from the cutting edge, the artificial tooth is in my opinion positively weakened.—W. C. K., *Quarterly Circular.*

Cement as an Aid in Starting Gold Fillings.—To anyone who has not tried starting gold filling with a little thin sticky oxyphosphate cement, I would say begin. Prepare your cavities the same as for gold alone. Then with a small, short, and slightly bent broach, place a quantity of thin cement the size of a pinhead, more or less, in one of the anchorage angles, press a small pellet of unannealed gold lightly in place, and continue with other similar pellets until you have a sufficient mass seated. Now mix a little more cement, and treat the opposite anchorage point (be it in incisor, bicuspid, or molar) in the same way, uniting the mass from the two points of anchorage. Proceed with your filling. There is no need of smearing cement all over the cavity walls or upon the enamel margins. Use your instruments deftly. If any cement should go where it is not wanted, scrape it away. By using cement in this manner you can practically make an inlay of your gold filling—for you can put a little cement at any part of the cavity you desire, for both its therapeutic and adhesive values.

Try a few prepared cavities in extracted teeth first, and you will find that the technique is so simple that words are a mere superfluity in describing it. Brown-colored cement has an advantage, for should any of it flow too near the marginal edge within the cavity, it can be seen and removed.—T. W. PRITCHETT, *Dental Review.*

OBITUARY.

DR. DWIGHT M. CLAPP.

DIED, September 18, 1906, at his summer home in Lynn, Mass., from cardiac disease, DWIGHT MOSES CLAPP, D.M.D., of Boston, Mass., in his sixty-first year.

The falling of this our distinguished *confrère* to the scythe of the grim Reaper is a deplorable event which affects a far wider circle than that of the immediate locality of his personal activities. There, of course, his energy and capacity in the matters which concerned his professional relations to his district and to his state were well known, with their splendid fruition; there, too, was especially known and appreciated the fact that he was not narrowed in mind by his interest in his special vocation, but was one whose outlook, as testified to by the various avocational fields he cultivated, marked him out as sustaining a robust, all-around relation to the world of humanity, including its social aspects, its literary and artistic products, its recreations, and its natural environments. But his personal influence upon the dentistry of his time belongs to the entire profession.

Dwight M. Clapp was born in Southampton, Mass., June 5, 1846. He attended the public schools of that town and afterward studied at Westfield Academy, and after having been graduated from that institution, he prepared for his life-work in the profession of his choice by placing himself under the preceptorship of Dr. H. M. Miller of Westfield, and some time afterward under that of Dr. James Lewis of Burlington, Vt.

Aiming to equip himself in the completest manner for his future work, he visited Europe in 1869, and during his few years' stay across the water was associated for about a year with Dr. Chas. R. Coffin of London, Eng., and subsequently spent some time with Dr. Mason of Geneva, Switzerland.

His return to this country was destined to inaugurate—by his opening an office for practice in Boston—that interruptedly successful professional and social career, the closing of which is the unhappy occasion calling for this brief sketch. He was associated with the "Hub" thenceforth until the end of his life, having from the first, by his personal qualities and professional efficiency, added many of his patients to his circle of personal friends, and speedily becoming recognized by his brother dentists increasingly as a force making for the best interests of dentistry. The Boston *Transcript*, in an obituary notice of Dr. Clapp which we have largely drawn upon in making the present sketch of his life, truly says: "It speaks eloquently of Dr. Clapp's qualities as a man that most of his intimate friends, and his associates in his sports, were those whom he first knew only as patients. Men went to him for his professional skill, but having once fallen under the spell of his unusual personality they became permanently his friends."

In 1882 he became instructor of dentistry in Harvard Dental School, which had conferred upon him the degree D.M.D., and for one year he occupied that position. In the same institution from 1890 until his death he fulfilled the duties of clinical lecturer in operative dentistry. In 1899 he became a member of the administrative board of the school, which retained the benefit of his presence in its councils during the remainder of his life.

He held membership in the National Dental Association, the American Academy of Dental Science, the Massachusetts State Dental Society, the Boston Dental Improvement Society, the New England (afterward the Northeastern) Dental Association, and the New York Institute of Stomatology: and for a period of ten years was a member of the Massachusetts Board of Registration in Dentistry. In the Massachusetts Dental Society, the Harvard Dental Alumni Association, and the Harvard Odontological Society he served at various times as president.

Dr. Clapp was the author of several papers read in dental society meetings, and of various articles appearing in the dental magazines. He also contributed to the "American

Text-book of Operative Dentistry" the chapter on Combination Fillings.

While perhaps no man had a wider circle of professional acquaintances or stood higher among them, yet his interest in his profession absorbed only a part of his energy and sympathies. He sought and found companionships which nourished his devotion to art, literature, and outdoor life. He was a member of the Boston Art Club, the University Club, the Oxford Club of Lynn, the Appalachian Club, and still other organizations. The love of nature, especially in its wilder aspects, was a vital concern with him. He was a member of long standing of the Megantic Fish and Game Club, and owned a camp in the Maine woods, where he was accustomed to spend a large portion of each summer. When professional duties kept him from these longer trips, he found wholesome recreation in other outdoor sports.

It was a source of great satisfaction to Dr. Clapp that his only son made choice of his father's profession, and the resultant association in practice was fruitful of happiness to both.

Dr. Clapp, in 1872, married Miss Clara Josephine Simonds, daughter of Henry Simonds of Lynn. She survives him. Two children were the issue of their union, a son and a daughter. The daughter, Ethel, died at the age of six years; the son, already referred to, is Dr. Howard Clapp of Boston.

The interment was at Pine Grove Cemetery, Lynn, on Friday, September 21st, the funeral services being conducted by Rev. Geo. A. Gordon, pastor of the Old South Church, Boston, of which Dr. Clapp has been an attendant for a number of years. A large gathering of professional associates of the deceased, some of whom acted as pallbearers, as well as a large concourse of personal friends, paid the last respects to the remains of their honored comrade.

DR. EDWARD M. BEESLEY.

Died, September 17, 1906, at his home in Belvidere, Warren county, N. J., of angina pectoris, Edward Maurice Beesley, D.D.S., in the sixty-second year of his age.

Edward M. Beesley was born in Dennisville, Cape May county, N. J., June 22, 1845. He was educated at the West Jersey Academy, Bridgeton, and his dental alma mater was the Pennsylvania Dental College, Philadelphia, from which college he was graduated in 1867. He began his professional career by establishing an office at Absecon. In the fall of 1871 he removed from Absecon to Belvidere, where he has ever since that time resided and carried on his practice.

From 1870 to 1873 he served as sergeant-at-arms in the New Jersey Senate, and in 1882 he was engrossing clerk of the same body.

Dr. Beesley, in 1893, was honored by his professional colleagues by being elected president of the New Jersey State Dental Society. For ten successive years he served on the State Board of Registration and Examination in Dentistry.

In November 1873 Dr. Beesley married Carrie A., only daughter of the late Israel Harris, for forty years cashier of the Belvidere National Bank. His wife died March 26, 1903. He is survived by two daughters—Dr. Eleanor Beesley, who is at home, and Mrs. Frank Mathews of Brooklyn—and one son, Maurice, who is entering his senior year in the Pennsylvania Dental College, the institution from which his father was graduated. Dr. Beesley is also survived by two sisters—Mrs. Julia Townsend of Philadelphia, and Miss Rhoda Beesley of Dennisville, N. J.

SOCIETY NOTES AND ANNOUNCEMENTS.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

Notice to the Alumni.

Any alumnus not having received a copy of the souvenir number of the *Pennsylvania Dental Times*, giving the proceedings of the golden anniversary of the Pennsylvania College of Dental Surgery, may secure the same by sending his name and address to

Wilbur F. Litch, *Dean*,
Eleventh & Clinton sts., Philadelphia, Pa.

ST. LOUIS DENTAL SOCIETY.

Golden Jubilee.

The St. Louis Dental Society, one of the two oldest dental organizations in the world, will celebrate its golden anniversary with a banquet and entertainment November 10, 1906, when the fiftieth year of its existence will be completed. Eminent men in the profession outside of the city and state will participate.

J. B. Newby, *Ch'man Com. Arrangements.*
W. F. Lawrenz, *Sec'y.*

FIFTH DISTRICT (N. Y.) DENTAL SOCIETY.

The thirty-eighth semi-annual meeting of the Fifth District Dental Society of the State of New York will be held in Utica, N. Y., November 13 and 14, 1906.

C. A. Sayers, *Sec'y*,
Watertown, N. Y.

OHIO STATE DENTAL SOCIETY.

The forty-first annual meeting of the Ohio State Dental Society will be held in Columbus, December 4, 5, and 6, 1906. A program of varied and exceptional interest has been provided, and we hope to surpass the very successful meetings of recent years. The papers are of the best, the clinics numerous and instructive, and the exhibits extensive and complete.

The membership of this society has nearly doubled in the last three years. If you are not a member, and are eligible, come and join; but come!

F. R. Chapman, *Sec'y*,
Columbus, Ohio.

AMERICAN SOCIETY OF ORTHODONTISTS.

The next meeting of the American Society of Orthodontists will be held in New York city during Christmas week, 1906.

Frederick S. McKay, *Sec'y*, St. Louis, Mo.

INSTITUTE OF DENTAL PEDAGOGICS.

The fourteenth annual meeting of the Institute of Dental Pedagogics will be held in Chicago, Ill., December 27, 28, and 29, 1906. The following subjects will be discussed: Teaching of Anesthesia: The Emergencies—How Treated, How Prevented. Teaching of Operative Technique. Teaching of Prosthetic Technique. A Method of Teaching Orthodontia. Teaching Porcelain Technique. Teaching of Materia Medica. Report of Committee on Dental Nomenclature.

W. Earl Willmott, *Sec'y*,
Toronto, Ont.

CENTRAL MISSOURI DENTAL ASSOCIATION.

The third annual meeting of the Central Missouri Dental Association will be held in the Hoffman building, Sedalia, Mo., November 20, 1906.

W. M. Carter, *Pres't*,
P. H. Brame, *Cor. Sec'y.*

G. V. BLACK DENTAL CLUB OF ST. PAUL.

The members and friends of the G. V. Black Dental Club of St. Paul (Inc.) will hold their annual midwinter clinic in February 1907.

Last year we held the largest, best, and most enthusiastic meeting ever held in the Northwest.

The program and dates on which the meeting will be held will shortly be published.

Members of the dental profession in the United States and Canada cordially invited to attend our clinic.

Special rates on all railroads. For any further information apply to

R. B. WILSON, *Sec'y*,
107 E. Sixth st., St. Paul, Minnesota.

LIVINGSTON (N. Y.) DENTAL CLUB.

THE following dentists of Livingston county have organized, forming the Livingston Dental Club: E. R. Griswold, F. W. Kuhn, G. H. Cutler, Dansville; J. W. Cowan, C. J. Fraley, Geneseo; M. C. Bradley, Avon; E. A. Clapp, Livonia; W. H. Povall, G. T. Moore, Mt. Morris; Wm. Gamble, Wayland.

The objects of the organization are to promote among the people, through the medium of the public schools and press, a better knowledge of the care of the oral cavity and the preservation of the teeth; and to advance and elevate dentistry, and the mutual improvement of its members.

J. W. COWAN, *Pres.*,
G. T. MOORE, *Sec'y*.

PENNSYLVANIA STATE DENTAL SOCIETY.

AT the thirty-eighth annual meeting of the Pennsylvania State Dental Society, held in Philadelphia, June 26 to 28, 1906, the following officers were elected for the year 1906-1907: J. T. Lippincott, Philadelphia, president; P. K. Filbert, Pottsville, first vice-president; C. B. Bratt, Allegheny, second vice-president; L. H. Weaver, Philadelphia, recording secretary; V. S. Jones, Bethlehem, corresponding secretary; W. A. Spencer, Carbondale, treasurer. Council—H. C. Register, E. J. Donegan, F. D. Gardiner (for one year); J. A. Libbey, H. B. McFadden, H. N. Young (for two years); J. C. Hertz, G. L. S. Jamison, H. S. Seip (for three years). Board of Censors—C. C. Walker, E. M. Bohn, Wm. H. Fundenberg, W. C. Scott, J. F. Kingsley. Executive Committee—C. B. Bratt, J. A. Libbey, H. M. Arthur. Legislative Committee—F. D. Gardiner, C. B. Bratt, A. S. Koser, J. T. Lippincott, G. L. S. Jamison. Committee on Enforcement of Dental Law—F. D. Gardiner, Geo. F. Root, H. Zimmerman, H. W. Bohn, D. C. Dunn, S. M. Stauffer, J. E. Habegger, C. H. McCowan, B. F. Witmer, C. C. Walker. Clinic Committee—H. E. Friesell, Geo. C. Parry, C. C. Taggert. Exhibit Committee—W. H. Haines, Hiram DePuy, Walter C. Fordham. Publication Committee—Luther M. Weaver, I. Norman Broomell, Otto E. Inglis. Committee on Ethics—H. C. Register, J. A. Libbey, W. F. Litch. Committee on Oral Hygiene and Public School Dental Education—H. N. Young, M. I. Schamberg, H. C. Register, H. Ralston Swing.

Note—The first named on each committee is its chairman.

V. S. JONES, *Cor. Sec'y*,
Bethlehem, Pa.

AN OPEN LETTER TO DENTISTS.

NEW YORK CITY, September 24, 1906.

WE solicit an expression of opinion pro or con from every dentist, whether a member of an organized society or otherwise, regarding the question of preventive dentistry. We ask for this expression with a view to testing the advisability of calling a mass gathering in New York city to consider the feasibility of setting on foot a systematic advocacy of this subject.

Please confer by letter with any of the following named men: Dr. E. S. Gaylord, New Haven, Conn.; Dr. D. D. Smith, Philadelphia, Pa.; Dr. L. C. Taylor, Hartford, Conn.; Dr. Saml. A. Hopkins, Tufts College Dental School, Boston, Mass.; Dr. C. M. Wright, Cincinnati, Ohio; Dr. Eugene Talbot, 103 State st., Chicago, Ill.; Dr. G. Alden Mills, 226 Central Park, West, New York city.

Those named in the foregoing list are asked to confer with the undersigned should they receive any responses to this open letter, which is issued from the conviction that the time is ripening for an earnest movement to be set on foot for the propagation of this, the most useful and important work ever brought to the minds of dentists. This movement is to be undertaken not in a controversial spirit, but as an advance step.

G. ALDEN MILLS,
226 Central Park, West, New York city.

NATIONAL DENTAL ASSOCIATION.

At the tenth annual meeting of the National Dental Association, held in Atlanta, Ga., September 18 to 21, 1906, the following officers were elected for the ensuing year: A. H. Peck, Chicago, Ill., president; D. J. McMillen, Kansas City, Mo., vice-president for the West; Geo. E. Hunt, Indianapolis, Ind., vice-president for the East; Geo. S. Vann, Gadsden, Ala., vice-president for the South; Chas. S. Butler, Buffalo, N. Y., recording secretary; Burton Lee Thorpe, St. Louis, Mo., corresponding secretary; A. R. Melendy, Knoxville, Tenn., treasurer. Executive Council—H. J. Burkhart, Batavia, N. Y.; J. Y. Crawford, Nashville, Tenn.; Chas. McManus, Hartford, Conn.; F. O. Hetrick, Ottowa, Kans.; B. Holly Smith, Baltimore, Md. Executive Committee—C. M. Work, Ottumwa, Iowa; V. H. Jackson, New York city; Thomas P. Hinman, Atlanta, Ga.

The next meeting will be held in Minneapolis, Minn., July 30, 1907.

Burton L. Thorpe, *Cor. Sec'y.*

BOSTON AND TUFTS DENTAL ALUMNI ASSOCIATION.

At the annual meeting of the Boston and Tufts Dental Alumni Association, held June 19, 1906, the following officers were elected for the ensuing year: George T. Baker, president; William Rice, first vice-president; Irwin A. Johnson, second vice-president; Marion L. Woodward, corresponding secretary; Robert W. Cram, recording secretary; Newton A. DeWitt, treasurer; James R. Piper, editor. Executive Committee—Irving J. Wetherbee, Frederick B. Stevens, William M. Flynn, Clarence A. Pettingill.

Marion L. Woodward, *Sec'y.*

OKLAHOMA BOARD OF DENTAL EXAMINERS.

There will be a meeting of the Oklahoma Board of Dental Examiners held at Oklahoma City on November 6, 7, and 8, 1906, for the purpose of examining candidates for license. For necessary blanks and information address

A. C. Hixon, *Sec'y,*
Guthrie, Okla.

MARYLAND BOARD OF DENTAL EXAMINERS.

The Maryland State Board of Dental Examiners will meet for examination of candidates for certificates November 7 and 8, 1906, at the Dental Department of the University of Maryland, Baltimore, at 9 A.M. For application blanks and all information address

F. F. Drew, *Sec'y,*
701 N. Howard st., Baltimore, Md.

NEBRASKA BOARD OF DENTAL EXAMINERS.

The next meeting of the Nebraska State Board of Dental Examiners will be held at the State-house, Lincoln, Nebr., on November 12, 13, and 14, 1906, for the examination of applicants to practice dentistry in Nebraska. For further information address,

C. F. Ladd, *Sec'y,*
1241 O st., Lincoln, Nebr.

RHODE ISLAND BOARD OF REGISTRATION.

The semi-annual meeting of the Rhode Island State Board of Registration in Dentistry, for the examination of candidates, will be held at the State-house, Providence, November 6, 7, and 8, 1906. Applications, together with the fee of twenty dollars, if first examination, should be in the hands of the secretary not later than November 1st.

W. S. Kenyon, *Sec'y,*
301 Westminster st., Providence, R. I.

ARIZONA BOARD OF DENTAL EXAMINERS.

The Arizona Board of Dental Examiners will hold a meeting to examine candidates in the Fleming bldg., Phoenix, Ariz., beginning Monday, November 12, 1906, and continuing through the 13th and 14th. All applications should be in the hands of the secretary by November 5th. Examination fee—twenty-five dollars ($25.00). For information apply to

W. P. Sims, *Sec'y,*
Box 58, Bisbee, Ariz.

OHIO BOARD OF DENTAL EXAMINERS.

THE regular semi-annual meeting of the Ohio Board of Dental Examiners will be held in Columbus, commencing November 27, 1906. Only graduates are eligible to examination. Application, accompanied by fee of $20.00, should be filed with the secretary by November 17th. For further information address

H. C. BROWN, *Sec'y*,
185 E State st., Columbus, Ohio.

CONNECTICUT DENTAL COMMISSIONERS.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Wednesday, Thursday, and Friday, November 7, 8, and 9, 1906, to examine applicants for license to practice dentistry.

All applicants should apply to the recorder for proper blanks and the rules for conducting the examination. Application blanks must be filled in and sworn to, and, with fee, filed with the recorder on or before November 1, 1906. By order of the Commission.

GILBERT M. GRISWOLD, *Recorder*,
783 Main st., Hartford, Conn.

ILLINOIS BOARD OF DENTAL EXAMINERS.

THE regular annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held in Chicago, at the Chicago College of Dental Surgery, cor. Wood and Harrison sts., commencing Monday, Nov. 12, 1906.

Persons in possession of the following requirements will be eligible to take the examination: First, all persons who have been engaged in the actual, legal, and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (Second), is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university; or (Third) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary upon application to the secretary. All applications must be filed with the secretary five days prior to the date of examination, and the diploma must be presented at the time of matriculation.

Address all communications to

J. G. REID, *Sec'y*,
1204 Trude bldg., Chicago, Ill.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of Pennsylvania will conduct examinations in Harrisburg, Pa., December 11 to 14, 1906..

For papers and particulars address the secretary of the Dental Council,

N. C. SCHAEFFER, Harrisburg, Pa.

IDAHO BOARD OF DENTAL EXAMINERS.

THE Idaho Board of Dental Examiners meets in Boisê City, December 27, 28, and 29, 1906, for the purpose of examining applicants for license to practice dentistry in Idaho.

C. E. M. LOUX, *Sec'y*,
Pocatello, Idaho.

KENTUCKY BOARD OF DENTAL EXAMINERS.

THE Kentucky State Board of Dental Examiners will hold their next meeting for the examination of applicants the first Tuesday in December. Every applicant must be a graduate of a reputable dental college. For further information address the president of the board.

J. RICHARD WALLACE,
The Masonic, Louisville, Ky.

IOWA BOARD OF DENTAL EXAMINERS.

[DATE OF MEETING POSTPONED.]

THE Iowa State Board of Dental Examiners has postponed its next meeting to a later date (to be announced).

E. D. BROWER, *Sec'y*,
Le Mars, Iowa.

NEW HAMPSHIRE BOARD OF REGISTRATION.

The semi-annual meeting of the New Hampshire Board of Registration in Dentistry for the examination of candidates will be held at Masonic Banquet Hall, Manchester, N. H., December 11, 12, and 13, 1906.

A. J. Sawyer, *Sec'y,*
Manchester, N. H.

NEW JERSEY BOARD OF REGISTRATION.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual meeting in the State-house, at Trenton, N. J., beginning Monday, December 10, 1906, at 9 a.m., and continuing through the 11th, 12th, and 13th. Practical and theoretical work completed at this place.

All applications must be in the hands of the secretary ten days prior to the meeting.

For further information apply to

Charles A. Meeker, *Sec'y,*
29 Fulton st., Newark, N. J.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS.

The Board of Dental Examiners of the District of Columbia will conduct the semi-annual examination at the Dental Department of Georgetown University, Wednesday, Thursday, and Friday, January 2, 3, and 4, 1907. All applications must be accompanied with a fee of ten dollars. For further information address

William B. Daly, *Sec'y,*
1311 R. Island ave., N. W., Washington, D. C.

INDIANA BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Indiana State Board of Dental Examiners will be held in rooms 11 and 12, State-house, Indianapolis, January 8 to 11, 1907. All applicants for registration will be examined at this time. For further information, blanks, etc., apply to

F. R. Henshaw, *Sec'y,*
Middletown, Indiana.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING SEPTEMBER 1906.

September 4.

No. 829,997, to Arthur Ollendorff. Manufacture of plates for artificial teeth.

September 11.

No. 830,872, to Hugh W. Arthur. Amalgam carrier and plugger.

No. 830,887, to Robert M. Craig. Denture.

September 18.

No. 831,185, to Josef Rawitzer. Cement.

No. 831,307, to Charles A. Spahn. Dental tool.

No. 831,489, to Jacob A. Thomas, Dental disk-holder.

September 25.

No. 831,943, to Chester M. Freeman. Dental handpiece.

No. 831,960, to Philip B. Lesemann. Artificial denture.

THE

DENTAL COSMOS.

VOL. XLVIII. DECEMBER 1906. No. 12.

ORIGINAL COMMUNICATIONS.

COMMENTS ON GENERAL PRACTICE.

By **WM. LEON ELLERBECK**, D.D.S., Salt Lake City, Utah.

(Read before Section I of the National Dental Association, at its tenth annual meeting, Atlanta, Ga., September 18, 1906.)

WERE we to supply a student taking a correspondence-school course in dentistry, if such were feasible, with the various dental journals from their inception to the present time, containing the writings of "scientific" Tom and "practical" Dick and Harry —offering them as a source of information—what a whirl of indecision and uncertainty he would soon be in as to the proper methods to pursue in almost any dental operation! To begin with, is he to believe that cavity extension to areas of relative immunity as prescribed by some is justifiable, or does this system involve a wanton waste of valuable tooth-structure, as claimed by others?

After having opened into a putrescent pulp, and having cleansed the canal—perhaps having treated with sulfuric acid followed by an alkaline carbonate—should he expect a maximum of good results by immediate root-filling? or is there wisdom in another's advice to first institute a series of daily treatments with medicaments, in order to destroy any pathogenic germs that may have found a pasture in the pericementum? Is the pyorrhea which he will encounter in the mouths of prospective patients merely a filth-disease, and curable, if at all, by local treatment, or are systemic conditions a causative factor, to be met by general treatment? In orthodontic procedures is he to believe that it is right practice to construct a complex lot of apparatus in order to turn a tooth here and push a tooth there, perhaps extracting a tooth or two to simplify?—that "The excessive expansion of the dental arch without extraction results from lack of broad education"? or is he to believe that extraction is a crime, and an attempt to deal with individual teeth fallacious, for the reason that the jaws themselves are primarily at fault and must first be corrected, must be properly expanded, etc., and that in the great majority of cases an adjustment of the articulation is the essential move toward correction?

Shall he use a vacuum chamber in a plate to give stability to the fixture through added suction, or does the employment of this device really interfere with perfect adhesion? Ought he to use soft or non-cohesive gold for stopping cavities, or must the same be used only sparingly, a thin lining at the most being all that is admissible, this to be followed by hard or cohesive gold? Shall he in either event pack the material by mere hand pressure—adaptation being the essential requirement, and great density being not necessary—in fact, great pressure or hard blows being responsible for a great many loose fillings? or shall he believe with others who, admitting the possibility of good adaptation by light packing, yet insist that fillings thus inserted will not stand the masticatory strain or stress but will ultimately tip and leak and consequently fail, and further, that great density is difficult to attain without rigorous malleting, and that fillings of less than a certain degree of density will absorb grease, inviting a recurrence of decay?

Is he to believe that the teeth in certain mouths—particularly in young girls up to the age of puberty—are of soft structure, and that gold for stopping cavities in such is not indicated at all? Also that caries will rapidly recur under such treatment, and that these teeth may best be filled with plastics until they are harder? Or is he to believe that teeth vary only slightly in density from youth to old age; that there is little difference if any in their chemical composition, but that all are practically of the same hardness; that systemic conditions and the matter of peculiar environment are the principal factors in causing caries, and that with proper cavity preparation on scientific lines gold may here be trusted, if properly packed, to best preserve these teeth? Is he to believe that it is foolishness to insert gold fillings in deciduous teeth; or is he to follow the teaching of those who claim that they fill the greater percentage of cavities in deciduous teeth with gold, and get satisfactory results? Is he to believe, as proclaimed by many, that porcelain fillings are a short-lived fad, that "They are not an advance in dentistry, and that no cement will hold them," etc.; or shall he heed the claim of an equal number, who hold that they are when properly done an ideal filling? Is he to band his crowns, or is he not? Shall he or shall he not remove the pulps from teeth preparatory to shell crowning? Shall he extract all four first molars, if one be unavoidably doomed, or extract only its fellow in the same jaw; or shall he leave the remaining three intact and chance any ill results that may follow from change in articulation? And so on, *ad infinitum.*

UNITY OF TEACHING NEEDED.

Throughout the entire field of dentistry, in the very essentials of practice, among the profession at large, there is seemingly little that is settled or agreed upon, and until some such means as the appointment of an international commission, comprised of the ablest, most scientific, and skilled of our profession, be adopted—to recommend to our educators a basis of agreement looking toward the teaching of definite methods and systems of procedure in the various features of dental practice, to follow which will, in their minds, secure a maximum of good results—a wide difference in the merits of the operations of different dentists who have imbibed their instruction under the tuition of different educators must necessarily be expected.

In a recent paper—I believe by Dr. G. Lenox Curtis of New York—I notice the suggestion is made that a prize be offered for the best system of treating alveolar abscess. The suggestion is a good one and should be practically utilized. What dentistry needs above all else is system, and some means of securing adherents to the system. Is the status of dentistry to be based upon that which may be accomplished, or upon the merits of that which is actually done? If upon the former we have reason to feel proud, but if upon the latter, much improvement is necessary.

We are advised to "stop the distracting discontent with our dental schools and our dental educational standards," and to "proclaim that the teachers are right, and that the curriculum is right and the very best in the world," etc. Also, among other things, to help our "export trade." Can we with honesty do this when we note that much of the product is defective? We might recently have lauded the packing plants as utilizing only sound hogs put up by perfectly sound employees, and distributing only high-grade products. It might have helped the "export trade," albeit it would not have cured the evil. Likewise with our dental colleges; just so long as we find the product imperfect can we hope to better it by honest criticism, and "Though the sword be sharp, it will not wound the innocent."

LOW DEGREE OF OPERATIVE COMPETENCE IN GRADUATES.

There are unquestionably a certain number of dental colleges with high ideals, and with a fair percentage of competent instructors, who graduate a fair percentage of competent dentists. At the same time, it is evident to many that there emanates from some source or sources a vast number of incompetents—at least, judging from the character of dental operations as we see them—in the main. If the deans of all dental colleges were appointed a committee to pass upon the merits of all the operations performed by the various dentists throughout the country, I venture to assert that they would render a report not at all flattering to our pride, viz, that the great majority of the operations would be pronounced inferior. Living in a western community, one of comparatively recent growth, and where there has been a large influx of new people from various parts of the United States, attracted by the many possibilities of investment in mining and manufacture and because of an ideal climate—a panacea for the aches and pains of many who have had poor health elsewhere—I feel that I have had an excellent opportunity to observe the character of dental operations which might be considered as an average of those done throughout the country at large. Were I to report upon all the work I have examined in the mouths of these patients—and I am sure the majority of them have been among those who have never for financial reasons been obliged to seek cheap service—I would say that the greater part of these dental operations were inferiorly done. Certainly, to be liberal, I would say that not over twenty-five per cent. could be classed as either good or excellent, and certainly seventy-five per cent. have shown cavities ill-prepared, gold poorly packed, crowns badly fitted, and generally unsanitary appliances used, little regard having been paid to the artistic element and less to the scientific. In addition to the foregoing, there has been apparent in very many instances an almost criminal neglect of inflammatory conditions. Of course, in such a caustic criticism one might be accused of a certain excess of the ego in constituting himself a judge of what is right, but if so I shall have to stand for that, although feeling that I might be reasonably excused on the ground of having spent considerable time in witnessing the operations of men in various parts of the United States who are generally well known as skilful, and while the comparison may not be made with my own work, it might justly be made with theirs.

LAXITY IN ENTRANCE REQUIREMENTS.

If the work which I have observed is a fair sample of that being done all over the country at large, and is as generally inferior as I have reported—and from consultation with certain men of this and other sections who report a similar finding, I conclude it is—what are the underlying reasons for this state of affairs?

What they all are I am unable to tell—would that I might! However, among the things which contribute to this condition, I believe one to be the too plentiful supply of dental colleges, which, creating a wide scramble for students, necessarily encourages laxness in entrance requirements, notwithstanding arguments to the contrary; also making it necessary to include too many incompetent instructors, and therefore too wide a diversity of opinion among educators under whose tuition our beginners are to be placed. Too many colleges which furnish the means to keep alive and make potent the lamentable influence of the so-called "practical man"—who most often works too much and reads too little, and who pronounces the work and suggestions of certain of our scientific investigators as of little practical importance—are still willing to believe that a certain mechanical aptitude is the essential requirement of a prospective student, criminally encouraging the unfit to take up dentistry.

By the unfit, I mean those lacking an education in the general sciences and in those studies which tend to develop philosophical reasoning, and who in consequence are unable to grasp fundamental scientific principles underlying right dental procedures, lacking which, as Kipling would say (with apologies for distortion), "They do not know, for they could not know, and never will understand." Or, in the wisdom of Confucius: "There are some with whom we may study in common, but we shall find them unable to get along with us to principles. We may go on with them to principles, but we will find them unable to get fixed in those principles; or, if we get fixed in those principles with them, we will find them unable to weigh occurring events along with us."

SCIENTIFIC TRAINING AND APPARATUS ESSENTIAL.

In reality, most of our educators, because of their training along scientific lines, and owing to their better education, are generally more competent to judge of the results of operations than the so-called "practical men," the majority of whom, unfortunately, are neither trained to observe as carefully, nor yet to make the most of their observations. In the light of modern laboratory research, bacteriological, physiological, pathological, mechanical, etc., it would be by no means gross exaggeration to say that the principles of cavity extension to areas of relative immunity; the preparation of cavities on scientific lines—as advocated by Professors Black, Johnson, Kirk, and other scientific educators—and the use of the various filling materials to best meet conditions, etc., might all have been evolved from general scientific considerations, and a fair estimate made of their practical value without the investigator having actually performed a practical filling operation.

We are admonished to read, and read we do, but if we are not to consider the principles evolved through the laboratory test as reliable simply because they were "tried on the dog" first, there is little left for guidance but intuition or preponderance of opinion. Our duty as practical men is to follow more closely the teachings of our scientific investigators, and to put into execution those principles evolved from time to time through the results of their research. The laboratory man might discover the mechanical virtues or physiological action of calomel, aconite, strychnia, digitalis, diphtheric antitoxin, vaccine, etc., but it remains for the physician to put to practical application the findings of the laboratory man.

The diagnostic value of saliva analysis, as indicating systemic conditions, is a closed book to many of us, and yet there are some making practical use of this medium. The X-ray apparatus for general treatment and diagnostic use seems to many an unnecessary amount of apparatus with which to burden a dental office, and yet it is being successfully employed by quite a number. A cataphoric apparatus takes up too much room, and is considered by many as a worthless time-consumer, and yet when properly used is one of the most efficient means of desensitizing dentin, and in many instances of actually saving time, permitting in fact more thorough and complete operations, and there are still a few of us who recognize its value and make practical use of its effects.

THE QUESTION OF SPEED.

As a practicing dentist, and as one having some considerable respect for my scientific instructors, I wish to say that I agree with many of their teachings, and endeavor, so far as I have facilities and am able to comprehend, to put them to practical use. At the same time, I must here beg to disapprove of the attitude of many of them who seem to impress students with the idea that work to be done well must needs be done slowly; for this is but tending to induce in them mental sluggishness through slow action, thereby lessening the extent of their usefulness, and quite definitely limiting their breadwinning possibilities.

Equally as important to my mind as instruction in paying attention to detail is the instruction of students as to the possibility of performing operations with alacrity and dispatch. It is as much our responsibility to cause as little suffering to our patients through fatigue as it is to perform our work well. The argument is made by certain educators in favor of military training in our public schools, that alacrity in certain gun drills and various company maneuvers tends to increase the student's mental activity. A rather interesting article on "Athletics," by Prof. J. William White of the University of Pennsylvania amply shows that the tendency of physical exercise and of sports requiring quick action is to induce mental activity. To learn to operate quickly, to avoid puttering, besides inducing mental alacrity, will incidentally relieve many dentists from becoming accustomed to, and often even satisfied with, a mere day's wage. I recall one prominent eastern dentist, an educator, who has on a number of occasions informed me of the hours of time he devotes to doing various operations; as, for instance, he may prepare a cavity one day, partially fill it another, complete the packing at another sitting, and may often require another appointment for the finishing, and he is firmly convinced that the same results could not be obtained in any less time. He is conscientious, but mistaken, and the value of his otherwise good teachings is largely offset by his impractical ideas as to time.

I once stood at the chair of a prominent Philadelphia dentist, a clinical demonstrator, for some four or five hours, watching him insert a medium-sized occluso-approximal gold filling, he having on a previous occasion nearly prepared the cavity. He remarked during the process of the operation that he made no attempt to work quickly, and called attention afterward to the fact that he had not dropped a piece or pellet of gold. Incidentally, the gentleman used the cylindrical handle end of an excavator to punch the dam, stretching the rubber over the handle at varying lengths from the end, according to the size hole desired, and then touching a sharp knife blade, a round hole was produced. This is a pretty but old "stunt." Now, the investment of $3.50 in a dam punch would very nearly have saved itself right there with some men, and if the dropping of a few pellets of gold would have saved a few hours or more time, then this small item of carefulness was very expensive and unnecessarily trying to the patient.

I have stood by the chair of the late Dr. Bonwill, and have seen him obtain just as beautiful a result and a filling just as well packed in considerably less than an hour's time. I have heard Professor Kirk remark that "If a tooth is worth a dam, put it on." Sage advice, in the main, but at what stage is it to be applied? In root-treatments, most frequently at once, but in cavity preparation its early application is by no means necessary. To do so simply means that the operator is obliged to breathe a great deal of infected tooth-dust. A post-mortem examination of the lungs of long-time coal-miners shows, most curiously, the infundibula to be stained to almost an ebony hue from carbon particles.

In many of the mills of the mines of the Rocky Mountains, where much crushing of ore is done, the inhalation of fine silicious particles has a bad effect upon the lungs of working men, and I am sure the inhalation of infected tooth-dust has its bad effect on the lungs of many dentists.

USE OF RUBBER DAM.

By those who are believers in "extension for prevention," and who know at a glance in most cases the extent of excavating necessary, much of the cavity preparation may be done without the use of the rubber dam, and I am sure the repeated syringing of débris from the tooth-cavity with warm water is more hygienic than blowing the material into the atmosphere with blasts of warm air. As it is, dentists are generally obliged to breathe too much carbon dioxid and too little ozone, and they owe it to themselves and to their family, in so far as possible, to conserve their health. If the "extension for prevention" principle evolved along scientific lines is a tooth-saver—and clinical evidence is substantiating that fact—it is still further a time-saver; notwithstanding the great cubic content of filling material required, the benefit of the light and room quickly gained, with the ease of insertion, all tend to expedite the work. It is actually annoying to observe some men who, first applying the rubber dam, begin to laboriously bore and scrape, blowing clouds of tooth-dust into the air, wasting time endeavoring to find out the extent of tooth-infection, and bent on conserving certain tooth-substance that caries and you, in the majority of cases, will remove at no far distant date.

USE OF MATRIX FOR APPROXIMAL CAVITIES.

While generally, properly selected chisels are to be relied upon, still in order to expedite work, I frequently do that which I have not seen advocated, but which I believe to be at times good practice, *i.e.* applying the matrix in preparing approximal cavities in bicuspids and molars where we desire a square base and where there are frequent opportunities, unless we proceed slowly, of cutting unevenly, perhaps wounding the gum, and perhaps damaging an approximating filling, or roughening the surface of an approximating tooth. I here use the Ivory matrix-holder and bands, which latter are inexpensive and which are usually spoiled in this procedure; in fact the bur may be severely damaged. But what matters a bur or two, and a band which costs but a cent or two, as compared with the time saved in expediting the work? By pressing slightly away from the pulp and toward the matrix from side to side, one quickly extends the cavity. A new square-end dentate fissure bur may often be used to advantage. This may be followed by the pear-shaped bur, and in order to get the floor perfectly flat, the inverted cone. The bur is held where one wishes it, and with little danger of inflicting damage to the pulp. The matrix, if not wedged, will be sufficiently yielding to permit of the gingival margin being trimmed evenly.

In the filling of occluso-approximal cavities, I believe there are too few dentists who employ the matrix. In the main, the average dentist will secure better contours, and because of the greater pressure than can be applied generally, better adaptation will be secured than where this appliance is not used. A matrix such as Crenshaw's when properly applied is as useful to the dentist as is the miter-box to a carpenter.

From many trials of inserting gold fillings into a steel matrix, such as employed by Professor Black in his experiments, I am able to testify that if sharp malleting be employed it will prove a great exception if the gold does not press perfectly into each angle, and I doubt if a two-part matrix could be so perfectly constructed as to keep the gold from showing a line where the pieces of steel come together. In a properly prepared cavity it is sheer evidence of lack of skill when one is unable to properly adapt the gold to the walls of the cavity. As to the method of anchoring the first few pellets of gold by burnishing into thin cement at the gingival seat and axial wall to assist anchorage, or using a thin lining of non-cohesive gold or tin, and a small fold arranged over the gingival wall preliminary to applying the matrix, there can be no objection, particularly in molars where there is a broad seat; though most frequently the use of a few tin pellets first loosely pressed over the floor and into the angles, and then condensed under a layer of cohesive gold held at one angle whilst being malleted at another to insure stability, enables one to apply the matrix with safety at once. It seems pretty generally conceded that tin has some intrinsic preservative quality in contact with tooth-bone; certainly this has been my observation. A thin film as a lining is all-sufficient. The pellets supplied by the Rowan Co., and suggested I believe by Dr. W. D. Tracy of New York, are admirably soft and adaptable. Even in small morsal cavities too shallow to line with cement, tin is always my base.

FAILURE IN GOLD FILLINGS DUE TO LOW DENSITY.

So far as my observations have gone, the great percentage of failing gold fillings are those of low density (and it is a curious fact that the over-cautious margin extender seems to be a light gold-packer). Inquiry has revealed that a great many of the failing gold fillings have been done by hand pressure, perhaps using the sponge gold, though as to this latter I cannot state, since patients more often remember how the filling was inserted than the kind of gold used. I have listened to various demonstrators employed by the manufacturers of sponge golds advocating their wares, claiming that fillings may be quickly built and perfectly packed by hand pressure, and by certain special instruments which they also sell. Not that good results are impossible; still I venture to assert that many are careless with this class of gold, and their method of packing explains many faulty fillings. A lining of tin or of soft gold, if you will, followed by cohesive gold in the great bulk of the filling, packed with good and vigorous blows, wherever possible with the Bonwill mechanical mallet, will produce a filling of the greatest density, of the least pitting, and the best able to stand the masticatory strain or stress. I recall a statement made to me by Dr. Bonwill, that the great majority of dentists did not know how to use his mechanical mallet, as they would not screw it up enough, and that they tapped instead of hitting, and while infrequently there are teeth the pericementum of which seems too sensitive to comfortably stand rigorous blows, yet there are ways of remedying this, and the time taken here in first inserting temporary fillings to relieve this condition is well spent, for the securing of great density through rigorous packing will insure a maximum of good results.

I recall testing a filling that Dr. Joseph Head of Philadelphia had inserted in a steel matrix, using cohesive gold, which showed density of 19.28, nearly equal to that obtainable had the gold been melted. The use of a matrix properly applied permits the approximation of this result in the mouth.

The finishing of occluso-approximal fillings with platinous gold is a method that is, I believe, too little indulged in. It certainly gives a hard finish, and is admirably adapted to withstand the masticatory strain or stress, and yet I believe the manufacturers will agree that no great amount of this material is used.

PORCELAIN.

With regard to gold in anterior teeth, I have little to say, for here I am a strong advocate of porcelain fillings, and feel that this material has come to stay. No more time is required for the preparing of the cavities by one who adopts a systematic method of cavity preparation than for gold; the time for their insertion is much less, the esthetic effects greatly to be preferred, the discomfort to the patient is reduced to a minimum, and the lasting qualities only limited by the ability of the operator.

The average labio- or labio-gingival filling, with proper cavity preparation, and giving anything like reasonable time for the making of the matrix, need not take over twenty to thirty minutes' time to complete, bake, and cement to place.

The dentate pear-shaped burs manufactured by the S. S. White Company are ideal for quickly opening into these cavities, followed by the dentate fissure burs for extending, and by me quickly finished with a special bur which I have had made by the J. W. Ivory Company, being merely a cylindrical plug-finishing bur about the shape and size of the dentate fissure bur, and like it bladed on the end. Cavities can be quickly and perfectly finished with a few movements of this bur, which besides leaving good edges also finishes the base of the cavities perfectly flat.

I have nothing further to offer you in the way of cavity preparation for porcelain fillings—the matter having been so completely covered by others—except to say that I should take issue with such men as Dr. Reeves, who claim that extension to reach free cleansing surfaces is not necessary for porcelain fillings; for if such necessity exists at any time it is still the requirement of the tooth and not the filling material.

CONSTRUCTING PORCELAIN CROWNS.

In the matter of porcelain crown construction, while admitting that by proper preparation of the root, bands may be so constructed as to occasion but slight irritation, and beautifully artistic results may be obtained, and it is my practice in many instances to construct banded crowns for strengthening roots; yet the principle of inlay work applied to such crowns as the Whiteside and the Davis, will secure likewise beautifully artistic results without the possibility of irritation, and porcelain is greatly to be preferred in most cases. The method of fitting such crowns is simple enough, and as follows: Selecting one of the crowns suitable to the case, it is so ground at its cervical portion that when placed upon the pin which has been fitted to the root, and its incisal edge in proper relation with the other teeth, it will not touch the root within one thirty-second of an inch of its labial, and one-sixteenth of an inch of its palatal aspect. The crown and pin are removed and high-heat gutta-percha is arranged around the pin and the neck part of the tooth, within reasonable limits representing the amount of tooth-material to be added. The gutta-percha is slightly warmed and the pin and tooth then forced to place, when with a very thin warm spatula the gutta-percha is trimmed to conform to the root-end—in fact now adjusted so as to represent the amount of porcelain material which is to be added to complete the crown and make it fit perfectly the root-end.

The whole thing is removed, and the tooth with the pin up is invested in plaster to the junction of the porcelain and gutta-percha and low-fusing metal fully trimmed to conform to the edge of this. The pin is now coated with plaster, the rubber ring placed around the pin and gutta-percha, and low-fusing metal poured over it. When cool, this is removed, the pin and gutta-percha drawn out, and, as will be evident, a little cup-shaped depression in the mold will be left, into which platinum inlay foil is carefully burnished just as for a porcelain filling. A hole is pushed through where the pin is to pass, and a little ingenuity in baking and carving enables one to bake this root-end, leaving a hole where the pin can pass through into the body of the tooth. Before removing the platinum, the crown is placed on the platinum matrix over the fused porcelain in its proper relation, and the two are fused together, the platinum thereafter being stripped off, when the tooth placed back upon the root should fit as perfectly as an inlay in a cavity.

GOLD SHELL CROWNS.

While not esthetic, the fact remains that bicuspid roots are frequently gold shell crowned. Now, the average perfectly cylindrical ferrules usually employed are most unsightly. The architectural construction of the buccal cusp of bicuspids shows it to "consist of three stanchions, of which the middle one is most marked," and the examination of many such teeth shows two faint grooves on each side of the middle stanchion or tubercle extending axially. Whether or not the other bicuspids may show this, and often they do not, it is well to produce this in a gold crown—even exaggerate it, for the reason that a polished curved surface shows a streak of white light, and the matter of having three curved surfaces instead of one increases the white light effect two hundred per cent., taking away much of the glamor of gold. Frequently where I have placed a crown thus made in mouths where perfectly cylindrical crowns on other teeth had been employed, patients have insisted on the other crowns being removed, and supplanted with the "crimped" variety. Certainly where gold crowns must be used, the artistic effect of this method is appreciated.

Frequently there presents in practice the case of the loss of an upper first bicuspid, and the patient is desirous of having a tooth supplied. The canine may be rotated and unsightly, and through excessive filling may be weak, and may be generally such that it seems best to crown it rather than attempt to use it for inlay or for bridge work; the patient, too, with you, being desirous of avoiding in this conspicuous place, at least on the canine, the display of any gold. If it is a case of close bite, or if a lower bicuspid has been permitted to extrude, the construction of a porcelain bridge entirely above is not indicated, because of lack of material to insure sufficient strength, then the application of a combination porcelain and gold bridge becomes desirable. The porcelain crown is constructed for the canine, a platino-iridium bar having first been soldered and extended from the ferrule to a cavity cut in the second bicuspid, either to be held in place by an amalgam or gold filling, or soldered to an inlay made by fusing platinum gold solder in a platinum matrix. The canine crown is finished in the usual manner, the bar or inlay being held during the baking in some investment compound. To secure sufficient strength in the bicuspid facing, it is of course necessary to use a metal tip and backing.

The porcelain crown having been completed, the bicuspid to be supplied is ground to place and backed; the cusp having been made of gold or platinum, it with the tooth is then soldered to the bar. It is evident, however, that a very unclean fixture will be produced unless some means be taken to insure the solder finishing flush with the porcelain. To accomplish this, first arrange some inlay platinum foil along the post-approximal part of the crown, far enough back on the labial side to be invisible unless viewed directly from the side. The bar having been pushed through it, it is brought into contact with the tooth. A little creamy porcelain body having been first smeared on it, it is burnished on the crown and baked so that the solder will flow to the thin platinum foil on the crown, and finished up perfectly, leaving no crevice for the lodgment of the ingesta.

THE TELESCOPE CROWN.

Quite frequently a case presents of the loss of the lower molars on one side. There are several so-called appliances for constructing a removable bridge to supplant these teeth, but most of them are unsatisfactory. The matter of constructing a really serviceable and removable bridge here, to my mind, can be best accomplished by the use of telescope crowns. Where the bicuspids are short, both first and second bicuspids may best be used, but where the bicuspids are long, and there is an opportunity for some considerable retention in the telescope crown, a second bicuspid is all that is necessary, merely using a half-clasp to fit on the first bicuspid to partially take up the strain of lateral movement. The method of telescope crown construction has been so well covered by different authors, that it would be presumptuous for me to take time to describe it in detail. My object in citing this case is merely to show an inexpensive means of supplying teeth by this fixture, for where those patients are unable to have the remaining part done in porcelain, or to sufficiently compensate one for constructing a gold-rimmed saddle, an inexpensive and thoroughly efficient appliance may be made by the mere soldering of a platinoid bar from the crown to conform to the general curve of the alveolar ridge, to this soldering saddle-back or even plain rubber teeth, and waxing up around the bar and teeth to represent a saddle, to be substituted by vulcanite. Two little chips of gold being soldered to the posterior part of the crown and roughened, permit the rubber to be finished up perfectly so that there will be no unnecessary crevices for food accumulation. I cannot understand why such fixtures are not more generally employed, unless because of the expense incurred by patients in having this appliance constructed with a porcelain or gold-rimmed saddle.

It is true that "The province of dentistry should be to prevent germs from collecting in the mouth, rather than to assist in their formation," and there are altogether too many filth-accumulating appliances inserted. The use of the bridge-plate fixture above described—which may be easily removed and cleansed—is hygienic and mechanically efficient. While some may object to the strain brought to bear on the bicuspid roots, on the theory that they were intended to do the work of only one crown, it does not apply here, for the saddle throws the work largely upon the jaw itself, and besides, the risk might well be taken on account of the material benefit of occlusion to be given to the upper molars.

The method of inlay bridge work is bound to revolutionize fixed appliances, eliminating as it does the irritant band, and thus prolonging the usefulness of the teeth used as abutments. I cannot but think that those who are not perfecting themselves in this method are in danger of becoming in arrears in an important feature of general practice.

REPLANTING OF INCISORS.

Another matter which frequently presents in practice is where a central or lateral incisor through some cause begins to extrude and protrude, spoiling, especially in women, an otherwise pleasant smile; while there often seems to be some pyorrheal indication, yet treatment seems to avail not, and the condition seems to progress, to the great annoyance of both operator and patient. One is wont to grind off the incisal portion to secure harmony, and yet this does not effect a cure. For some time I have adopted the method of extracting these teeth and replanting, and with very satisfactory results. Knowing the ultimate result of delay—general weakening through root-absoption, etc.—I operate on these teeth early.

After preparing the root properly as for general replanting, and—unless there has been considerable infection—using nothing stronger than normal salt solution in which the tooth is held while being prepared, the root-end is slightly trimmed away and smoothed, if honeycombed, the root-socket deepened, and the tooth replaced in normal alignment, and there held until union takes place.

One of the most annoying disfigurements encountered in the mouths of patients is where some disease of infancy has interfered with the nutritive process, and has caused an imperfect calcification of the enamel cap, causing the teeth to be pegged or pitted to a varying extent, according to the severity of the disease and the age at which it occurred. At times the incisal portion of all or part of the twelve anterior teeth are thus affected, the enamel being quite imperfect, pigmented, and decaying, and in young girls and women especially, porcelain tips are required to correct this unsightly condition and to preserve the balance of the tooth. To resort to jacket crowns as some do may be likened to "using a battle-ax to sever the head of a hen"—unnecessary valor!—and the method of using pins for attaching the tips is not desirable, especially in the teeth of young people. Generally there remains a part of the dentin below the line of affected enamel which is strong even if pigmented, and with care the tooth may be prepared so as to leave a pin-like projection of this dentin to make an excellent dowel with which to anchor a porcelain tip. This may be made after the method of constructing a jacket crown.

RECREATION.

There are many little points with reference to things in practice concerning which I should like to make comment, but this article is long drawn out. In conclusion, then, I will add as a practical phase of dental practice, that while professional dignity is a desideratum in keeping with our great profession, and the matter of too great hilarity in a dental office to be decried, yet I believe there are many who take their work too seriously and who tend to impress their patients with this seriousness, where a certain joviality might lighten both the spirits of the operator and the patient, and in a measure take away the dread of dental operations. One of the best western dentists I have ever known has recently quit practice because of the nervous strain largely induced, I believe, by the over-seriousness with which he took his work. While the matter of abstaining from commercial or business pursuits, and the centering of one's whole thought dentally might tend to make one more careful of the business details of practice, yet I am inclined to feel that in our profession, speaking generally, there is no great opportunity for wealth, and that too close confinement to one particular thing is neither broadening nor helpful; the matter of a little better insight into business conditions and commercial affairs, to enable one to invest his surplus of income over liabilities, and in a general way to present some diversion for mental recreation, is not to be lightly looked upon. At any rate, if through lack of mental discipline one cannot refrain from thinking business during the hours of office practice, and he finds it unwise to risk diversion through business ventures, I still believe that the average dentist will make more money, live a longer and more useful life, by practicing from ten to three continuously, and devoting the remaining part of the day to healthful, recreative pursuits, baths and massage, golf, tennis, driving, etc., than to put in the laborious hours which many do, and which seem momentarily profitable, but which with the great majority lead to mental depression, general ill-health, and early decay.

THE HUMAN SKULL USED AS A GNATHODYNAMOMETER TO DETERMINE THE VALUE OF TRITURATION IN THE MASTICATION OF FOOD.

By **JOSEPH HEAD, D.D.S., M.D., Philadelphia, Pa.**

(Read at the union meeting of the Maryland State Dental Association and the District of Columbia Dental Society, Washington, D. C., June 7, 1906.)

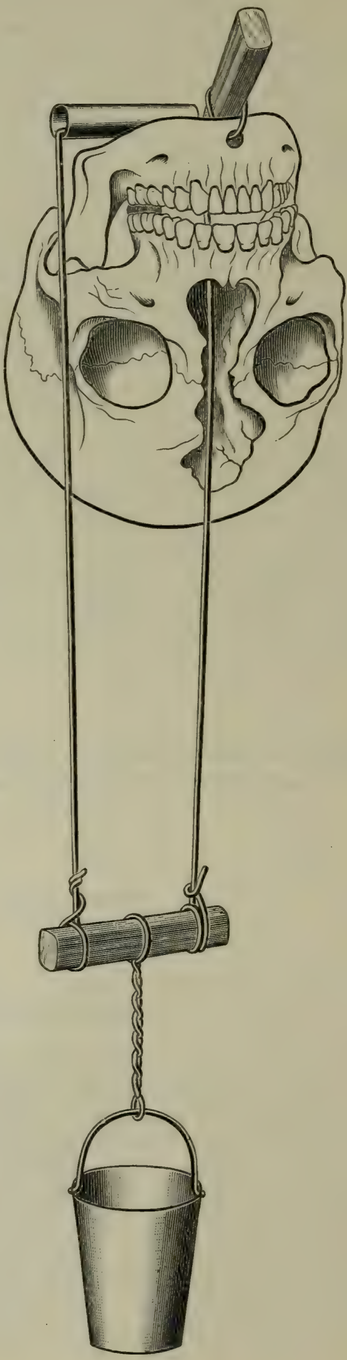
IN 1895 Dr. Black published a series of articles that will continue to be an inspiration to scientific investigation for years to come. In these papers he especially asks that his deductions be not taken unreservedly, but expresses the hope that his work may be but the basis for future research. The very depth and comprehensiveness of his work bring to light questions that are open to further investigation, and it is one of these questions with which my paper sympathetically deals.

In the COSMOS for 1895, vol. xxxvii, pp. 478–484, Dr. Black explains his instrument for measuring the force required to chew food, and gives his figures. which have since filled the dental profession with surprise and wonder. His instrument consists of two molar teeth carved in brass, which are forced against corresponding teeth by a sliding bar.

The stress is exerted on a spring which is registered on a dial plate. The force is applied in a purely up-and-down direction by means of a lever. This instrument does not give a grinding or triturating motion, so Dr. Black's experiments are confined to the forces required to chew food by a direct thrust, and viewed in this light there is no reason to question the accuracy of his results. He expressly states that he does not give figures on cereals because with cereals a triturating force is used by the teeth, and this force cannot be shown by his machine. He, however, believes that in the mastication of meat there is no trituration, but only a direct thrust; that the direct thrust is most effective; and he cites as further proof of this contention that purely meat-eating animals are precluded from trituration by the interlocking of the upper teeth with the lower. This last is open to the counter thought that while in carnivora there is no lateral jaw motion, there is considerable trituration by the teeth owing to the gliding past each other of the long sharp cusps just previous to the locking. In fact, they give an absolute scissors motion, which is trituration carried to its utmost limit.

On page 479 of the volume of COSMOS cited, Dr. Black points out that long sharp cusps with just a fair degree of closeness of the general surfaces and with just a fair degree of closeness of contact seem to do the work better than a so-called perfect occlusion where there is absolute contact. This in itself would seem to favor the value and general use of trituration, for if the cusps fit loosely between other cusps like a pestle in a mortar, a direct thrust unaccompanied by a triturating motion would not tear meat but only puncture it in a series of spots.

The following experiments have been undertaken from a curiosity to determine the amount of triturating force required to chew food, especially meat. For this purpose a natural skull with practically perfect molars of average size was used. The tests were all made with but two molars and their occluding teeth. This corresponded to Dr. Black's machine. The method of arrangement was as follows:



The skull was turned upside down and the condyles of the lower jaw loosely tied into the sockets. Attachments for weights were then made to one side of the jaw just opposite the space between the lower first and second molars. The skull was so tipped that the force of gravity would, during mastication, give a sliding or triturating motion. The method of attachment was as follows: A three-quarter inch hole was bored through the palate, nasal chamber, and frontal bone. A strong brass tube was then fastened across the body of the lower jaw, and a German-silver wire run through with both ends hanging down. To the ends of these wires were attached a cross-bar and a bucket in which could be placed the weights used for giving the masticating force to the occluding molars. The tube, wire, cross-bar, and bucket were so arranged that the force of gravity would be evenly and directly applied to the teeth in question. A wooden handle was attached to the lower jaw for the purpose of raising it when food was to be inserted between the teeth preliminary to the masticating test. In making these tests great care was observed to apply the force slowly, as it was noted that a sudden snapping of the jaw upon the food would bring into play momentum, which is not a factor in natural mastication.

The first experiments were with bread. Dry, crisp crusts broke at 15 lbs. pressure. But a mixture of soft inside and crust, such as we ordinarily find, could not be bitten through with a force of 60 lbs., which was all that was considered safe to use for fear of breaking the skull. The crust and inside formed a dense immovable mass. But when a little saliva was placed on this same mass it was readily masticated with a force of 3 lbs. Dr. Black notes this behavior of bread, and points out why so many of our patients break their teeth when they were, to use their words, "only biting a soft crust of bread."

The tables for vegetables are as follows:

Asparagus, roast onion, peas, roast potato were chewed with 1 lb. to 2 lbs. pressure.

	lbs.	Dr. Black. lbs.
Raw cabbage.......	16	40–60
Raw onion	4	
Head lettuce	8	25–30
Radish, whole, broke at	20–25	20–25
Radish, pieces, pulverized at	10–15	35–40

These give a fair idea of what pressure the vegetables under a slight trituration will demand. It is noted that my test of radish, 20 to 25 lbs., is exactly that obtained by Black, as with so large a thing there could be no trituration. With lettuce, where trituration was possible, only 8 lbs. was needed, where 25 to 30 lbs. was required by the direct thrust of Dr. Black.

Following is a table of the forces necessary to masticate meats, where a slight trituration is used:

	lbs.	Dr. Black. lbs.
Corned beef........	18–22	30–35
Boiled beef	3	
Tongue	1– 2	3– 5
Lamb chop	16–20	
Roast lamb	4	
Roast lamb kidney.	3	
Tenderloin of beefsteak, very tender	8– 9	35–40
Sirloin steak	10, 20, 43	
Round of beefsteak, tough	38–42	60–80
Roast beef	20–35	35–50
Boiled ham	10–14	40–60
Broiled ham	10–13	
Pork chops	25–30	20–25
Roast veal	16	35–40
Veal chops	12	
Roast mutton	18–22	

Dr. Black's figures, as shown in part, average very much higher than those given by the skull. I also give his interesting table for comparison where different foods are used:

	lbs.
Boiled corned beef, nice and tender	30–35
Beefsteak, medium well done—chuck	40–60
Beefsteak, well done—chuck. .	45–60
Beefsteak, rare, very tender—loin	35–40
Beefsteak—round	40–50
Beefsteak, well done, rather tough	60–80

	lbs.
Mutton chop	30–40
Mutton steak	35–45
Roast veal, tender	35–40
Roast beef	45–60
Roast beef—loin	30–35
Pork chops—loin	20–25
Roast pork	30–35
Boiled ham, nice and tender	40–60
Cold boiled tongue—central part	3– 5
Tongue—near root	15–20

It will be noted that Dr. Black's direct pressure averages much higher than the tests made with a slight trituration. Pork chops and tongue are the only meats that come below 30 lbs., and most of his figures go as high as 40 or 50 lbs. Concerning trituration figures on tenderloin and sirloin, it is interesting to note that in one steak the tenderloin was particularly tough. The tests bore out these impressions. The tenderloin was afterward found to masticate at 8 lbs., while the sirloin took 43 lbs. Other sirloins, as indicated by the table, readily crushed at between 10 and 20 lbs.

The figures seem to indicate that trituration in the mastication of food is a great help. Of course, there may be and probably are many people who, having great force, crush their meat with 80 to 100 lbs.—just for the pure joy and habit of crushing it, whether it crushes at 4 or at 80 lbs.; but where a man has artificial teeth and has had trouble in learning to use his teeth—such a man will soon find the value of trituration and will use it to the full extent.

Dr. Black's figures on the direct force required to crack candies and nuts are well known and are apparently indisputable. They need no comment, since they do not concern trituration. As has been before stated, this question of trituration was in Dr. Black's mind and was carefully considered. For reasons that appealed to him he thought the direct thrust did the work with the least effort. Dr. Black by his dynamometer has conclusively proved that the human jaw is capable of exerting a pressure of 150 to 300 lbs., which is certainly sufficient to meet any demands, but it is still a question whether we ordinarily chew meats by direct force, using from 30 to 80 lbs. pressure, or whether we through habit use trituration, and thereby greatly reduce the amount of force required.

A REMOVABLE POST AS FAST AND STRONG AS AN IRREMOVABLE ONE.

By CHARLES TAYLOR, D.D.S., Hamilton, Vict., Australia.

THIS post can be removed in five minutes. In order to handle it easily, take a long piece of plate of dental alloy or iridio-platinum, No. 20 or 23 gage, of a width equal to the length of the post required. With a pair of flat pliers, the edges of which should not be too sharp, a small hammer, and the anvil, turn up the edge of the plate, and then turn it over on itself, to form a tube. Cut this tube off, and on the anvil tap it into a more regular form.

To reduce the size and to perfect the joint, place it in a pin-vice or parallel pliers in a horizontal position, and, with a fine gold-plate fret-saw, saw through the joint longitudinally, and on the anvil tap the joints together again.

To still further reduce the size, and to make the joint more perfect, repeat the sawing and tapping. By repeated sawing and tapping this hollow post can be reduced in size until suited to a lower incisor. Although frequent annealing is necessary, one can be prepared in about five minutes. A few can be made and put by ready for use. This post may be cemented into the root in the ordinary way, and yet by means of a spear-pointed drill may be removed in a few moments; a drop of oil should be used in drilling. There is no risk of the drill not going straight, as the hole will lead it down the post. The spear drill should be just a shade smaller than the outside diameter of the post. I am surprised that the manufacturers do not make hollow round iridio-platinum wire. The wire is not appreciably weakened, as a hole as small as that in a small hypodermic needle is quite sufficient to lead the drill.

During the last year I have made all posts hollow, whether for crowns or abutments for bridges. In making a crown, the hole in the post near the crown may be blocked with the point of a lead pencil, to prevent the solder from flowing inside the post. Up to the present I have not considered it necessary to solder the joints in the posts; in fact I am awaiting the appearance of long or short lengths of hollow wire.

PHYSICAL METHODS IN THE PRACTICE OF DENTISTRY.

By SENECA B. BAIN, M.D., Washington, D. C.

(Read before the union meeting of the Maryland State Dental Association and the District of Columbia Dental Society, Washington, D. C., June 7, 1906.)

PHYSICAL therapeutics is every day coming to occupy a more important field in the practice of medicine, and owing to its efficiency in the treatment of general and local diseases it is well to review the field occasionally to see if any of the newer methods can be of use to the dentist.

Physical therapeutics embraces all methods of curing disease except the giving of drugs, and includes the following subjects: Diet, personal hygiene, exercise, massage, vibration, hydrotherapy, thermotherapy, electricity, X rays, and light. It is not my purpose in this paper to give the theory of action or the technique of application of these various methods, but to give you a general review of the whole subject so far as it applies to dentistry.

Under the head of diet there are several points of interest to the dentist. In cases of children with very soft deciduous teeth and of women during pregnancy, the question of diet becomes a very important one so far as the future of the teeth is concerned, and one often not mentioned by either doctor or dentist. There is in both cases a deficiency of certain salts for tooth-formation, which can easily be supplied by giving them those foods which contain these salts in abundance, such as whole wheat, rye, and Graham bread, or better still, buns or crackers made of the wheat bran.

Under the same head should be included something in regard to mastication, and the necessity of good teeth for its proper performance.

Hygiene and exercise are general measures, and have no particular interest for the dentist. Local cleanliness of the oral cavity must of course be impressed in the treatment of all diseased conditions of the mouth. Massage and vibration can be spoken of at the same time so far as they can be applied to dentistry. In all cases of inflammation due to infection or abscess formation, these measures will be found useful to relieve the pain and remove the swelling. Hydrotherapy and thermotherapy are practically the same thing in effect—one using water to carry heat and cold, the other air. While in general practice these are most useful methods, their use in dentistry is limited to producing hyperemia. Hyperemia stimulates the circulation within the area treated, unloads the veins, stimulates the function of the lymphatics, depletes the deeper structures, and accelerates and intensifies local metabolism. In this way toxic material and inflammatory products are excreted or absorbed, the nutrition of the part regenerated, and a powerful impetus given in the direction of the restoration of normal conditions.

Among the various physical or mechanical therapeutic agents known to modern medicine, *light* is in point of clinical usefulness and therapeutic efficiency entitled to first place. It is one of the elements without which life is impossible. Upon this point all scientists agree. Not all physiologists, however, seem to realize that the hygienic importance of light is not greater than its curative power. In order to understand the therapy of light, it is necessary to know something about the physics of light. If we cause the white light of the sun or of the electric arc-light to fall through a prism, the result is a splitting up of the light into its component rays. Technically, the arrangement of the component rays of white light is known as the solar spectrum.

The seven different colors or rays of light are red, orange, yellow, green, blue, indigo, and violet. These rays are known as the visible rays, in contra-distinction to numerous forms of invisible light energy situated beyond either end of the spectrum, as the infra-red and ultra-violet rays. Some of the rays, notably those emanating from the red and more especially the infra-red fields of the spectrum, are known as the thermic rays. Other rays, particularly the yellow and green, are light-producers, and are known as luminous rays. The rays of blue, indigo, violet—and more especially the ultra-violet fields—are capable of producing characteristic changes in the chemical composition of organic and inorganic matter, and are commonly known as the chemical or actinic rays.

There are several forms of apparatus on the market supplying arc lights and incandescent lights, plain and with various colored globes. Blue and violet rays have an anesthetic action on the nervous system, and with a suitable light you can give relief from toothache in a few minutes; you can quiet a nervous patient, and work with comfort after a short application; you can produce anesthesia for extracting teeth. The powerful lights, 300- to 500-candle power, owing to their intense heat, can be used to produce all of the effects of hyperemia spoken of under hydrotherapy, in addition to a very powerful chemical effect from the actinic rays of light. Owing to the ease of administration, the absence of shock to the patient, the convenience and cost of the apparatus, I consider this the best of all physical methods in the practice of dentistry.

FRACTURES OF THE JAW.

By P. W. MORIARTY, D.M.D., Boston, Mass.

(Clinic at the union meeting of the Massachusetts Dental Society and the Section on Stomatology of the American Medical Association, Boston, June 8, 1906.)

THE best treatment of fractures of the jaw requires an accurate readjustment and fixation of the fractured parts. These steps of the treatment should be so carried out as not to interfere with the functions of the part, with the required dressing of an associated wound, or with the proper sanitation of the injured jaw. The method of treatment that will enable the patient to open and close the mouth and to masticate suitable food with comfort is unquestionably the ideal one.

When I first undertook the treatment of fractured jaws in 1888, the literature of the subject was very meager and consisted principally of reports of cases. I have read everything printed upon the subject within my reach, and, as the result of my work in the treatment of over three hundred cases I have systematized the method of treatment, always giving the preference to appliances that allow a patient to open and close the jaws, and thus be able to take necessary nourishment.

The first step in the treatment is to cleanse the mouth thoroughly by syringing it with an antiseptic solution, and to remove as much as possible the salivary deposits that may be present. Very loose teeth should be removed, but a tooth more or less out of position may be brought into line by pressure exercised with the thumb and forefinger; and while such a tooth may make a good recovery, even though the pulp has been devitalized by the traumatism, in most cases after-treatment by filling the root is required.

SIMPLE FRACTURES.

If I find that the fracture is a simple one (the fracture in such cases is usually at the median line), and with but little displacement of the fragments, or perhaps if the fracture does not extend entirely through the bone, and the teeth on both sides of it are firm, I prefer to use the Angle bands by placing them on teeth one or more distant from the line of fracture, and subsequently binding the two together with Angle's wire, putting a small piece of gutta-percha over the wire ends in order to protect the mucous membrane. If the case be not a simple one, I take an impression of the maxilla and mandible in modeling composition; removing about one-half in depth of the walls of the impression trays, filing and rounding their edges; using as little of the composition as possible, in order to facilitate the easy removal of the impression. An impression of the teeth alone is necessary.

To take an impression of a fractured mandible, have the patient sit in a low chair, and have an assistant stand behind the patient and support the mandible by holding a folded napkin under the chin. An impression taken in this manner causes very little pain. I very seldom use an anesthetic. Plaster casts are made from the impressions, on which the lines of fracture are clearly indicated, and no attempt is made to readjust the fractured mandible before taking the impression. With a fine saw the cast is cut in the direction of these lines, and the lower teeth are articulated with the plaster cast of the maxilla. This is a very simple matter when the patient has most of the teeth remaining in the mouth, or if the upper teeth are artificial and well articulated. When these conditions do not exist the readjustment of the fragments requires considerable judgment and skill.

After running plaster around the divided casts to hold them in position, the upper and lower casts are fixed in an articulator. The following are the various appliances that I use in the treatment of fractures of the mandible:

(a) Angle bands.

(b) Continuous capping of aluminum or other metal, which I described in a paper published several years ago, and which was first used on a case at the Harvard Dental School. This is cemented on to the teeth. It is very neat, not noticeable, and is especially desirable in the treatment of fractures in children not having yet lost the deciduous organs.

(c) Vulcanite dental splint.

(d) A splint which I have devised, used with gutta-percha, modeling composition, or "Fraxo."

(e) Wire arms and chin-strap.

(f) Metal chin-piece and wire arms.

(g) An interdental splint.

(h) Artificial plate splint. The plate if broken is repaired and the boxes attached to the sides.

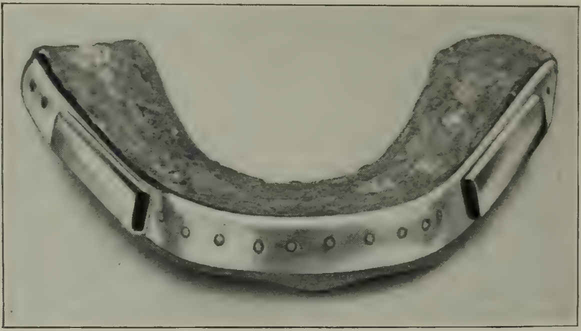
(i) Jaw-supporter, used at night or in connection with Angle bands or aluminum capping as an additional support.

A NEW SPLINT.

The casts of the jaws being on the articulator, open the bite about the sixteenth of an inch. Rub French chalk on the teeth of the plaster casts to prevent the gutta-percha, modeling composition, or Fraxo from sticking.

If gutta-percha be used, soften it with dry heat, warm the splint slightly and apply sufficient gutta-percha to fill the under side of the splint. Press it on to the plaster cast of the fractured jaw. Place only enough gutta-percha on the upper side to give a close strike. Chill with cold water after removing the splint and gutta-percha from the articulator. Trim and remove the surplus gutta-percha with a hot knife; smooth all edges with a hot spatula, then replace it on the cast, pressing around any gutta-percha that may have been disturbed. Remove it from the articulator, chill it again, smooth the edges if necessary, when it will be ready for placing on the fractured jaw. (Fig. 1.) This splint, properly adjusted and assisted by the jaw-supporter (Fig. 2) for the first day and afterward at night, answers the purpose satisfactorily in a considerable number of cases.

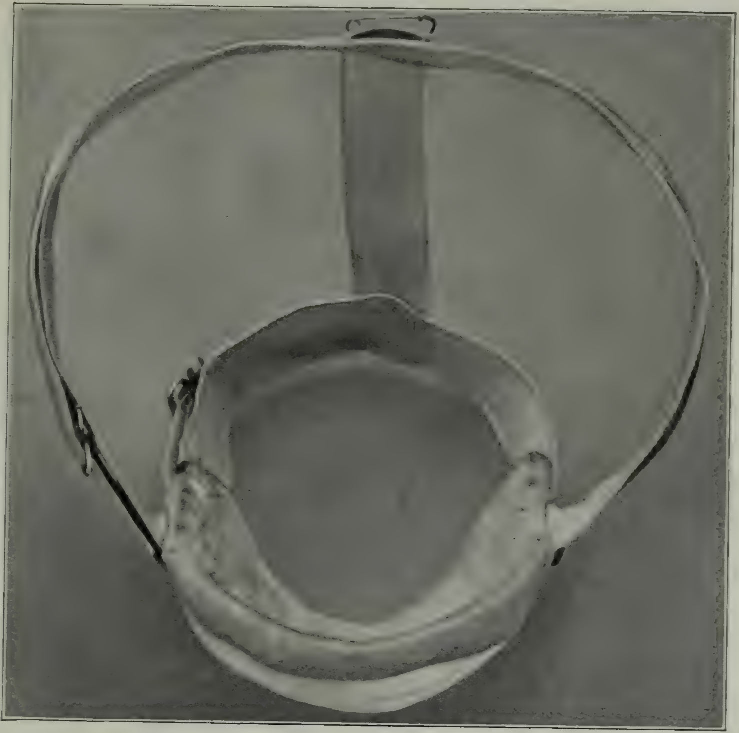
Fig. 1.



Splint with gutta-percha ready to place on fractured jaw.
(Dr. Moriarty's new splint.)

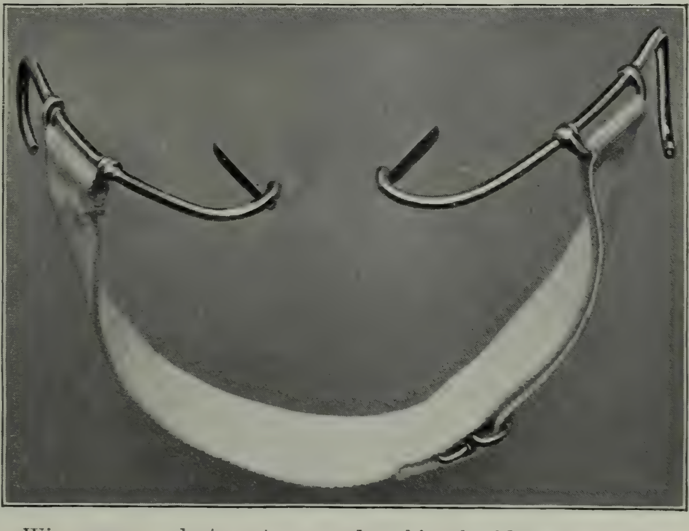
If the patient present a double fracture of the mandible, I insert the wire arms and use the strap under the chin (Fig. 3); but if the case be of the character re-

FIG. 2.



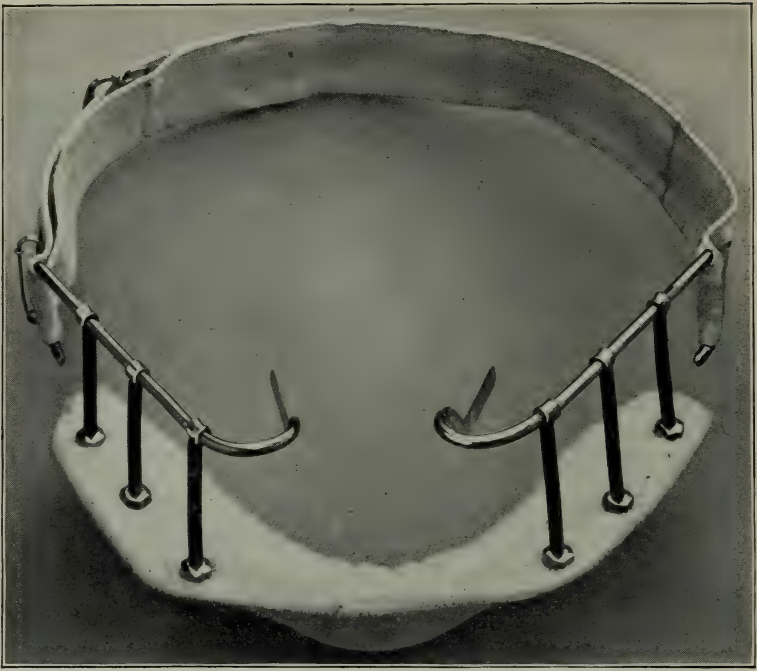
Jaw-supporter. Metal under chin; straps of 1¼-in. webbing on head.

FIG. 3.



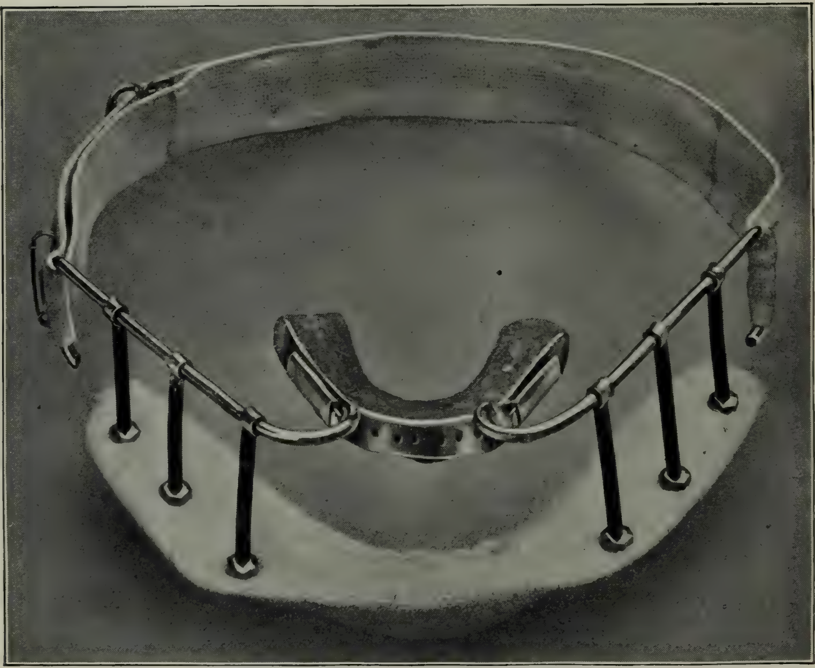
Wire arms, and strap to go under chin; buckle on one side.

Fig. 4.



Chin-piece, wire arms, and bolts.

Fig. 5.



Same as Fig. 4; attached to splint.

quiring considerable pressure to hold the fractured jaw in position, I use the wire arms on the splint, the chin-piece, and the screw bolts. (Figs. 4 and 5.) This combination of appliances is very effective in serious cases.

COMPLICATED CASES.

As an example I shall describe a double fracture of the mandible where the line of fracture was situated on the right side in the region of the first molar, and on the left side between the canine and first bicuspid. In addition to the bilateral fractures, the case was complicated by a fracture of the ascending ramus on the left side. I used on this case the splint I have devised, in connection with gutta-percha, the wire arms, screw bolts and chin-piece, with an additional strap going over the head to support the ramus. (Fig. 6.)

Treatment of fractured jaw when the patient wears artificial teeth. Repair the plate if broken, and attach boxes to the sides of it, using the plate for a splint, and proceed as for an ordinary fracture of the mandible as previously described.

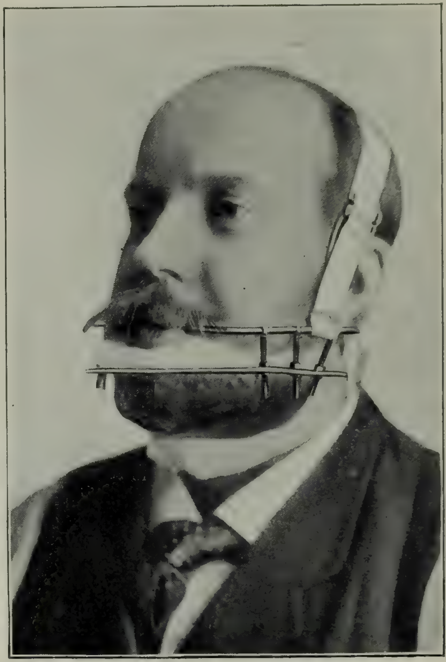
Fractured maxilla in an edentulous mouth, patient not wearing an artificial denture. Obtain impressions as before described, wax up, and use your best judgment. With a vulcanite interdental splint assisted by the jaw-supporter a good result can be obtained. I had a splendid result in the case of a lady seventy years of age, who fractured the mandible on both sides in falling down some steps.

Fracture of the ascending ramus; edentulous jaw. Make a splint similar to the preceding one, being careful to maintain the correct relationship between the maxilla and the mandible in order to prevent an open space at either side of the ramus.

In these last two mentioned cases I keep the jaws firmly closed; but in all of the other cases the patients are enabled to open and close them at will.

In fractures of the maxilla the treatment is practically the same, excepting that the straps are carried over the head instead of under the chin. I am opposed to bandages and wiring of the teeth on general principles, but there are exceptional cases where they can be employed with good results. I do not believe in wiring the mandible itself. I have yet to meet with failure in my treatment of a fractured mandible, but have seen many deformities resulting from wiring the jaws together.

Fig. 6.



Patient with appliance on.

After applying the splint the patient should be seen daily for the first week, remembering that thorough sanitation of the mouth is of as much importance as the adjustment of a properly applied splint. Have the patient use a Moffitt syringe, and with a good antiseptic solution syringe the mouth thoroughly every two hours, or oftener if necessary. Keep the mouth clean. Do not allow the patient or anyone else to tamper with the splint.

THE DIAGNOSTIC VALUE OF THE CENTRAL FACIAL LINE.

By GEORGE V. I. BROWN, A.B., D.D.S., M.D., C.M., Milwaukee, Wis.

(Read before the Dental Society of the State of New York, at its annual meeting, Albany, N. Y., May 11, 1906.)

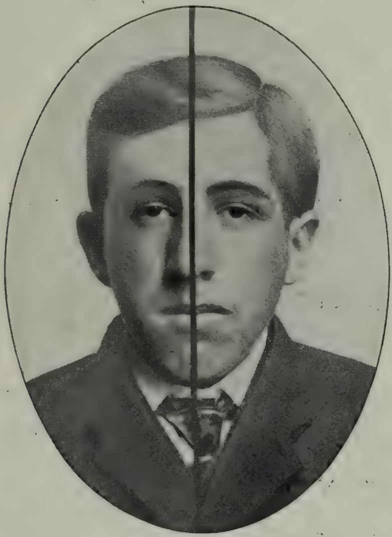
IN the practice of medicine, surgery, and dentistry, we are daily learning that with better understanding of diagnosis, therapeutic and operative methods become correspondingly simplified. The usefulness of human lives, or parts, is almost hourly saved or lost in just proportion to the ability of those in charge to make an accurate, early diagnosis. In dentistry the present need is even greater than in other branches of practice, for the reason that literature is so incomplete in this respect, there being little that is accurately and systematically written with reference to exact methods of diagnosis of oral disease, and particularly concerning differentiation in the study of symptoms which by exclusion might enable the diagnostician to determine with certainty the nature and cause of pathologic disturbances the origin of which may be obscure and the symptoms confusing.

The chief difficulty of present-day surgery of the face, lips, jaws, and palate lies in the failure to grasp the underlying principles of development in this region, and want of appreciation of the proper relation of associate parts in their influence upon the form and character of these special divisions of this field.

Large numbers of cases come to me with the history of one or more previous unsuccessful operations; quite frequently it is evident that the general surgical skill of the operator—who nevertheless failed to secure a good result—was of a high order, but not having recognized some apparently slight though really important factor, the post-operative deformity was greater than the congenital one. What is true of the general surgeon in this respect is equally true of the rhinologist, aurist, oculist, and the orthodontist, each according to the special conditions of his special field. Happily present-day scientific progress has brought about a fuller realization of the value of recognizing anatomic, physiologic, and pathologic interdependence in the treatment of disease, and there is every reason to believe that study along this line will be correspondingly profitable. One should never forget that in dealing with asymmetrical anatomical conditions in every portion of the human organism, as with every pathologic state, there are, first, pre-natal conditions, or tendencies handed down along the line of descent; second, post-natal exaggerations of the hereditary conditions and acquired defects. With the first we can have little to do, since in the working out of the great law of natural or unnatural selection we have not been consulted. Let us be ever so keen in the detection of the stigmata of degeneracy, ever so quick to note neurotic tendency, once conception has taken place these must work out according to the law of heredity, whatever that may be, and subject to the influence of environment.

It is, however, of great value that we should know that with certain types of neurotic predisposition there is accompanying unstable nervous development, and a naturally following tendency to irregular cell distribution, which invariably leaves its impress upon bodily development, manifest in more or less variation from normal form as recognized, even to the extent of deformity in more marked individuals, in order that the factors tending to their increase may be controlled. No part is free from subjection to these influences, but owing to the fact that with each generation born under the influence of our so-called advancing civilization there is a notable tendency to increase in size of the brain-case, with correspondingly less development of the maxillæ, face, mouth, and orbits, it appears that the surrounding cavities or sinuses suffer the greatest difficulty in approaching proper form, or at least structural inequalities are more constantly in evidence through prominence if nothing more.

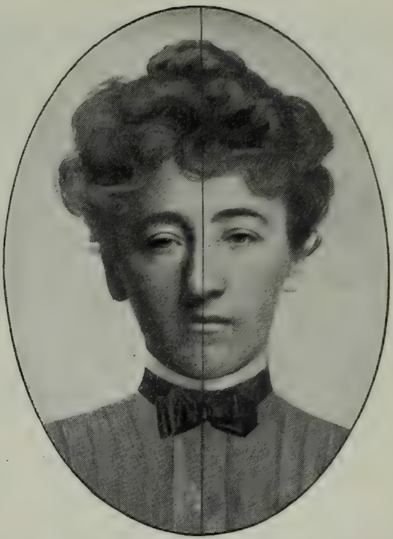
FIG. 1.



Nasal obstruction, hypertrophic rhinitis, enlarged turbinal bodies, deviated nasal septum, and catarrhal condition of nose, throat, and pharynx. Marked irregularity of both upper and lower arches, which were much contracted. Picture indicates central facial line, with nose upon one side. Differences in the region of the maxillary antra and other peculiarities of maxillary development are apparent. (Selected from a large number of similar cases because the variation from the central facial line is less marked than is usual under similar conditions, and yet derangement of associated development is quite plainly to be seen.) Nasal disease was much relieved by expansion of the dental arches.

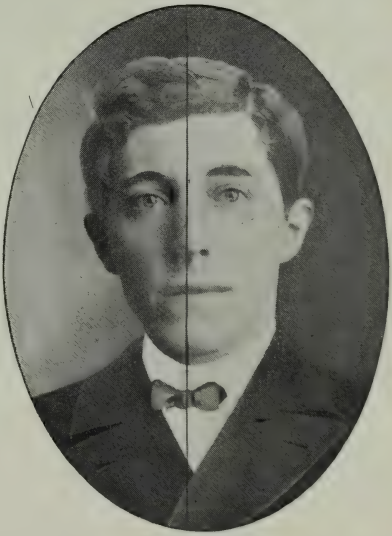
After metabolism the chief factor, or the one most directly active in determining the size and shape of the face, is muscular force, principally that exerted by the muscles of mastication or of expression and respiration. These in turn are dependent upon development of the teeth, because without normal tooth-erup-

FIG. 2.



Nasal disease with conditions corresponding to those described under Fig. 1. Expansion of the upper arch, with operative nasal treatment, was of much benefit.

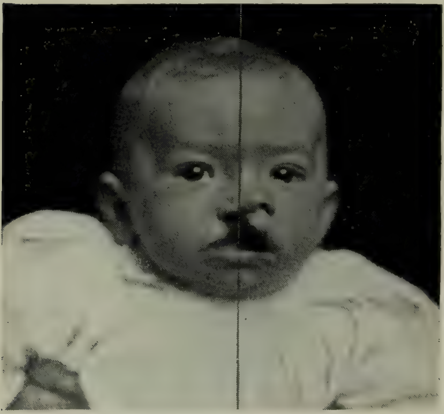
FIG. 3.



The patient from whose nose the enlarged turbinal body which was exhibited in connection with the reading of the paper was removed. Both nose and throat were diseased and the upper arch was much contracted.

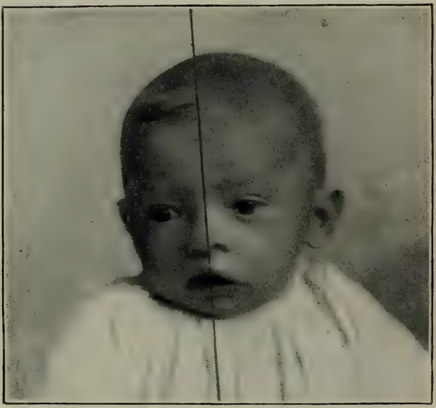
tion, normal jaws and palate are impossible; and since muscular action depends upon the underlying bony structure, this in turn is disarranged, and becomes in greater or less degree a factor in causing mal-development of the superior maxillary bones, thus in large measure affecting tooth-development, which reflects upon the nares, and therefore perfect nasal form and function become impossible under these conditions. We might continue to follow developmental relationship until our cycle was complete, since the ill effect upon health and

FIG. 4.



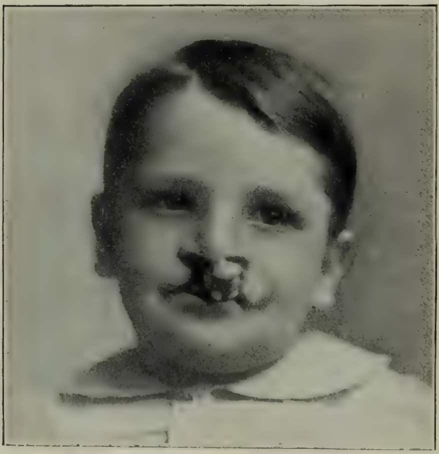
Central facial line emphasizes the characteristic deformity due to imperfect development in single hare-lip and cleft palate case. In this as in the other illustrations, pre-natal and post-natal factors are involved. The effect of muscular action is also apparent.

FIG. 5.



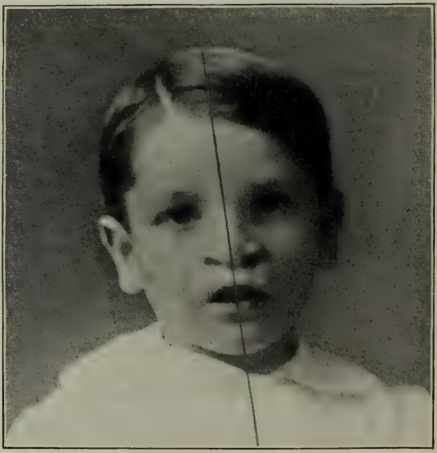
Same baby as shown in Fig. 4, after operation. The nearer the parts in such cases can be brought into harmony with the central facial line, the better cosmetic results will be obtained and the more nearly normal development of associated structures will follow.

FIG. 6.



Double hare-lip and cleft palate case. Boy four years old. Exaggeration of the deformity in consequence of unrestrained abnormal muscular action is shown.

FIG. 7.



Same boy as shown in Fig. 6, after operation. The significance of the central facial line is illustrated as in the other cases. No teeth were sacrificed to obtain this result, therefore continued improvement may be expected.

growth of both brain and body following mouth-breathing, nasal stenosis, or nasal disease, and want of oxygenation due to these conditions, is almost without limit in its application.

A SIMPLE PRACTICAL GUIDE.

In my practice during the past few years there has been forced upon me the conviction that one of the most practical and yet simple guides is to be found in careful study of a direct line from the center of the forehead to the same division of the chin. (See Figs. 1, 2, 3.)

One's eye can determine at a glance whether the nose deviates from this imaginary central division; if the deviation is confined to the cartilaginous or bony nasal structure, or includes both; and if tendency be shown in one portion of the nose to leave this central line with corresponding return of the remaining part. With most forms of malocclusion the mandible is forced more or less out of line when the jaws are closed; and in opening or closing the mandible, the nearer the mental process follows this central direction without lateral variation in its movement the nearer all conditions pertaining to temporo-maxillary articulation will be found to be normal; and conversely, the greater its lateral variation may be found to be, the more one might expect to find disarrangement in the harmony of inferior maxillary relations. With this division in mental view, asymmetrical development of the two sides of the face, and a difference in the orbits or situation of the eyes, is at once noticeable.

A brief glance taken through the heads of embryos at the fifth to eighth week, and at later periods with study of corresponding tooth-development, leaves no room for doubt that any cause arresting or increasing either maxillary or dental development must make itself manifest in the size and form of the orbits, the nares, the maxillary and associated sinuses, and the form of the jaw, as well as the arrangement of the teeth. That such relationship continues until growth is complete is amply proved by the accompanying illustrations (Figs. 4 and 6), which show that with both single and double hare-lip cases there is marked distortion of form with tendency to become exaggerated on account of adverse muscular action. That this can often be overcome by using the adhesive plaster strip to set in motion the irregularly attached muscles in a regular way, is shown by the results. In addition to this, if such muscles are attached by surgical means in their proper relation, the tendency is in the direction of progress toward natural form and correct anatomical conditions. (See Figs. 5 and 7.) This is shown by other pictures of those imperfectly operated upon for whom the final result appears to be rather worse than the original. Many photographs, as in Fig. 2, show patients with noses out of line whose lips and palates show no fissure, yet the appearance is much the same as that in cases of hare-lip.

APPLICATION OF THE FOREGOING PRINCIPLES.

With these principles demonstrated and accepted, we turn to the question of applying them in their diagnostic and pathologic significance for our present purpose.

I desire first of all to make it clear that no one could appreciate more fully than I do the disadvantage of claiming too much for causal factors in disease which happens to lie within the sphere of one's own division of daily experience; and though it may appear that the significance of the imaginary line, which is the subject of this discussion, is given a rather wide application, let it be remembered that we refer to it only as a diagnostic indication—not as a distinct cause of disease. Though its frequent association with conditions leading to disease gives it importance that ought not be ignored, we nevertheless freely admit that many persons may be afflicted with pathologic conditions such as are referred to in this connection, without marked asymmetry in nasal form. In the pursuit of the study of true etiologic factors, and the symptomatology by which not only definite knowledge of the nature of existing disease may be acquired, but forewarning of the likelihood of its coming be given to the end that it may be prevented, no indication is too slight to receive due notice; every feature of each individual patient becomes important, and any sign that may point the way—no matter how insignificant it may appear—becomes of value if only it lead to the desired end.

The value of considering the points previously noted as being brought more clearly into view by the central facial line will be more apparent when it is remembered that difference in form and location of the eyes, ears, and other features, thus made more noticeable, are distinct indications of neurotic conditions, and have a recognized place among the stigmata of degeneracy.

These and other marks of an unstable nervous development are matters of vital importance, since Kiernan, Talbot, Brower, and others have noted and proved by many illustrations from practical experience with individual cases, that during periods of stress, and particularly at about the time of eruption of the first molar teeth, such children are particularly susceptible to peripheral irritation, and upon comparatively slight provocation will develop nervous states of very serious character, notably epilepsy, chorea, and nervous habits of various kinds that may be more or less permanent according to conditions and treatment. At about the age of puberty susceptibility to such influences is again apparent, and the foundation for ill health during after-life, or calling of the death-roll more rapidly by contraction of some fatal disease, is a result that might often be prevented. Who should be the first to give warning to prevent such catastrophe if not the dentist; and when he knows that high, contracted palatal vaults, deviated nasal septa, adenoids, mouth-breathing, ill-consummated bronchial and lung development, imperfect oxygenation, therefore anemia, and imperfect bodily development, are all in train at this time and productive of still greater disturbance of an already irregular nervous system, is it not imperative that he take timely note of the many indications that come directly under his eye, and first among them this simple line, that may almost be said to be the key to the situation?

Malocclusion which disturbs the position of the mandible, as indicated by the mental processes being out of line and by irregular movement in action, means that the jaw in such individuals is never absolutely at rest, and unconsciously or otherwise there is constant effort to find that which it should have.

Cryer has proved that changes actually do occur in the condyles and the glenoid cavity, just as we would expect from our knowledge of bone-absorption under unusual stress.

At various times and places, I have during the past few years called attention to the effect of nervous jaw-habits and tooth-grinding upon diseases of the pericementum, in pyorrhea alveolaris, and similar affections, as also in diseases of the nervous system, such as neurasthenia, muscular tic, tic douloureux, facial palsy, and nervous conditions of lesser degree, with reference to cases, which it is unnecessary to repeat at this time.

For the same reason let him beware who, for the sake of purely cosmetic effect, extracts teeth in the correction of dental irregularity; and again, let those who would keep a regular dental arch once gained take note of this central line in considering occlusion that may prevent future disturbance of esthetic lines.

These enlarged turbinal bodies [exhibiting] were removed by Dr. Nelson M. Black of Milwaukee from a patient having marked nasal deviation from the central facial line. (See Fig. 3.) They speak rather eloquently of the evil possibilities of nasal disease—impossibility of proper nasal breathing, which means insufficient air-warming and air-straining in preparation for lung entrance as well as regarding the effect upon oxygenation. They further illustrate the fact that such growths mean ultimate displacement of the surrounding parts; thus without internal nasal examination our guide line might be expected to lead to their apprehension.

Passing the question of nasal catarrh and of throat diseases as being too obvious to require elaboration in this connection, we take note of the inequality of the two sides of the face, and referring again to Cryer's valuable work in demonstrating by actual sections the frequency of great differences existing in the size and form of maxillary antra in the same individual, the outline thus marked is of no little importance in determining the point of entrance and probable extent of the sinus upon the affected side in the treatment of empyema.

In addition it is also an aid in discovering the existence of such disease, because with irregular nasal form the tendency to mucous engorgement is much greater, hence degenerative conditions are more likely to occur. The effect upon the Eustachian tubes, and through these channels infection of the middle ear, is also sufficiently clear to this audience without extended reference to widespread deafness from this cause.

TUBERCULOSIS.

It is passing strange in view of the facts that have just been submitted, that in the wave of universal revolt against the ravages of tuberculosis—the great "white plague" that is taking states and cities by storm throughout the world, with one in every seven deaths from every cause being laid at its door, and an average of three hundred and fifty deaths per hour throughout the world, —also in the campaign against its close-competing rival, pneumonia, so little is heard from dentists; for you will agree that with early notice of this kind of facial irregularity and other indications that lie within and around the oral cavity—which could easily be corrected by early widening and correction of dental arches, by co-operation through reference of cases to rhinologists, and in other ways, to the end that there might be better breathing, more perfect jaw-occlusion, wider freedom from local nerve irritation, improved digestion, and better metabolism—then there would also be increased resistance to disease; and much depends upon full improvement of the great opportunities that lie in the way of every dentist.

The following quotations from "General Medicine," edited by Billings and Salisbury, just off the press, seem to voice the essence of my contention so perfectly that somewhat extensive quotations appear to be demanded.

B. Stiller says: "The heredity of phthisis is not the inheritance of the disease, but the inheritance of a weakened constitution, which under favorable circumstances permits the development of the disease. It need not show phthisis in the immediate ancestry, but what is transmitted is the general asthenia. The tendency in phthisical patients to dyspepsia is merely the expression of the general tendency of the asthenic individual to nervous dyspepsia, aggravated by the depressing influences of the infection. The premonitory dyspeptic phenomena are also instances of this nervous dyspepsia appearing as the result of depressing influences, which also favor the occurrence of the specific infection. That other types of individuals are necessarily exempt from tuberculous infection is by no means to be claimed, but that the asthenic constitution affords a more favorable soil for the development of the disease would appear to be reasonably well established."

Wood says: "The tonsillar tissue of the throat, because of its peculiar anatomic construction and its topographic relations, is more liable to become infected by tuberculosis than any other part of the upper respiratory tract. In nearly all cases of advanced pulmonary phthisis the faucial tonsils become inoculated. In about five per cent. of hypertrophied pharyngeal tonsils, some form of primary tuberculosis will be found. Primary infection of the faucial tonsil is a rarer condition."

Durck says with reference to living bacteria: "As a rule the components of this bacteriologic flora are quite harmless parasites, either in consequence of the bactericidal power of the body fluids, or because they are continually removed by the leucocytes or by the ciliated epithelium; only, however, to be carried again by particles of dust or inhaled sputum into the smallest bronchioles and the alveoli; or to reach them by their growth along the surface of the mucous membrane. For the development of disease there is needed another factor besides the mere presence of bacteria, and this consists either in some injury to the tissues by which their resisting power is lowered and they become no longer able to restrain the growth of the germs, or in some change of the circulation, by which the tissues and their fluids become better soil for the development of bacterial life, which then becomes able to attack the tissues themselves."

He says further, with regard to pneumonia: "The pneumococcus is indeed the specific cause of genuine fibrinous pneumonia, and, when its influence is great it can, upon reaching the air-passages, without further aid overcome the natural protecting mechanism; or when by the weakening of the latter the ground for its development is in some special way prepared."

L. Buerger says: "Normal persons often harbor the pneumococcus in their mouths. Of the 78 cases examined, 39 showed the presence of the pneumococcus." Miller has also demonstrated this.

S. Cohen, in referring to different forms of asthma, includes as one of them "asthma dependent upon nasal or nasopharyngeal obstruction and irritation."

Again he says: "Asthma may arise from irritation—peripheral or central—in the nose, throat, bronchi, skin, viscera, in the circulatory media, or even in the brain itself."

Parsons says, with reference to the etiology of influenza and conditions favoring infection, that these may be such as will enhance the virulence of the specific organism, or decrease the resistance of the individual; and calls attention to the fact that bacteria from a speaker's mouth have been thrown forty feet.

Leaving out the unsettled contentions of Behring, who claims that infection always takes place from bovine tubercle, and Koch, who takes the reverse position, denying the transmissibility between human and bovine tubercle bacilli, the sum and substance of modern treatment of tuberculosis resolves itself into increase of pure air and food, better oxygenation and greater assimilation, and rest. Surely our lesson is obvious.

Situated as I am in the special field to which my practice is limited, I stand as it were in the doorway, looking in upon the wonderful, one might add the glorious, achievements of modern orthodontists, my heart filled with admiration of the great work they are accomplishing; but just *outside* the door my vision furnishes me a view of such possibilities, for the benefit of humanity, of recognition for orthodontia by the scientists of the world, as might raise for it also the deepest respect of all mankind.

Let it be understood that the following regrets, which it seems someone should utter at this time, are given only in a temporary sense—because the necessity for them must be at most a transient matter—and with all kindness to all concerned.

(1) We must regret the tendency shown in recent writings by those high in orthodontia circles to substitute sarcasm for science, for while such efforts may bring more or less discomfiture to the opposing side, no good can result scientifically or otherwise.

(2) The narrowness of an evidently limited view, which prompts whole series of articles upon straightening teeth without due recognition of this influence upon surrounding maxillary and other structures.

(3) The comparatively slight heed that is given to etiology of dental irregularities, and this, too, when Talbot has spent more than the working period of an ordinary lifetime in gathering scientific data along these lines; who has also given us in concrete form that which it will probably take another generation to fully understand and properly apply.

When the time comes, as I surely believe it will, that broad knowledge of embryology and pathology shall be combined with true understanding of normal and abnormal developmental processes, and such knowledge made practically useful through high development of mechanical training, then will health and beauty wait upon our best endeavors as never before, and the benefits conferred pass beyond the bounds of present understanding.

CORRESPONDENCE.

NITROUS OXID AND ETHYL CHLORID.

To the Editor of the Dental Cosmos:

Sir,—In the issue of the Dental Cosmos for October 1906, Dr. M. W. Ware makes a few comments on my article, "Shall We Abandon Nitrous Oxid for Ethyl Chlorid or Somnoform?" published in your August issue. Dr. M. W. Ware says:

> Dr. M. M. Friedland, the author of the same, wrongly attributes to me the statement which follows. He says, "Dr. Ware in conclusion states: 'As the patient had one year ago experienced an apoplectic stroke, perhaps due to embolism from the heart, it is possible that a recurrence of the attack may have been the cause of death, as ethyl chlorid is too quickly eliminated from the system. *No matter what caused the death directly, the indirect cause was, after all, ethyl chlorid.*' "
>
> The statement in quotation marks is paraphrased, and its last sentence, which I have italicized, is original with Dr. Friedland.
>
> Such misrepresentation is only a part of the meager proof that Dr. Friedland has brought forward to condemn ethyl chlorid. The death-rate—1 in 17,000—given by him, held good four years ago; today it is nearer 1 in 40,000, obtainable from the published cases. This mortality is midway between that of ether and that of nitrous oxid, and on the face of it entitles ethyl chlorid to serious consideration as a general anesthetic. It will not supplant nitrous oxid, but will usurp its place in many fields, and this, furthermore, for economic reasons as well as practical advantages.
>
> Finally, I wish to call attention to the fact that the mortalities recorded have occurred at the hands of the inexperienced. In skilful hands the death-rate is a negligible factor, and when the administration of anesthetics shall become a specialty in dentistry, as has come to pass in surgery, the extraction of a tooth under ethyl chlorid may rise to the dignity of a major operation.

With all due respect to Dr. Ware I wish to state that I had no intention to misrepresent him; that the last sentence was intended as my own personal belief and opinion, and is that which I still hold, and I profoundly regret my error in the marks of punctuation.

As to the "meager proof" that I have brought forward to condemn ethyl chlorid, I would state that although I used statistics of four years ago—and with much pleasure I greet the new record that ethyl chlorid has established—I can only repeat that it is our duty in the interest of our patients and our duty to ourselves to select the safest anesthetic. All will admit that safety is the principal factor and that which must be taken into consideration above all. We also know that figures are stubborn facts.

Assuming even that ethyl chlorid be administered by the expert anesthetist, and the mortality be reduced to one-fifth or one-tenth of its present figure, still nitrous oxid should be preferred, disregarding the material and practical disadvantages that it has when compared with ethyl chlorid—as nitrous oxid is administered without any preparation of the patient; and furthermore, in rare cases where patients are examined as to their physical condition, it is administered freely by competent and also by incompetent men, nevertheless it holds the safest undeniable record.

In justice to ethyl chlorid I would say that I have no motive actuating me to condemn it; I have simply pitted it against nitrous oxid with special reference to its use in dental surgery; and in conclusion I will add that it is merely a case in which one drug is superior as compared with another for certain purposes.

Yours truly,

M. M. Friedland, D.D.S.

New York, October 17, 1906.

REMOVING PINS FROM ROOT-CANALS.

To the Editor of the Dental Cosmos:

Sir,—Some time ago, in the *Stomatologist,* I contributed a short memorandum in regard to removing broken Logan or other crown pins from root-canals, in which I advocated the use of the S. S. W. trephine No. 253 in suitable cases, on the grounds of speed and safety—as obviously a trephine was not as likely to perforate a root while the pin inside it prevented any lateral deflection. Of course I also mentioned other methods. Somehow, when published in the Periscope department of the Cosmos my name appeared transformed into McGernon (*Dental Hints,* however, being, I believe, the original orthographic culprit).

In the October issue of the Cosmos a gentleman from Kansas writes that he "thinks" he has a better method, which as described simply means boring out the cement around the pin—the practice of my student days, with the difference that whereas we then used a bur, he suggests a three-sided home-made drill, formed from a bur by grinding down.

It is difficult to see—(a) why a drill, *per se,* is less likely to perforate a root than a bur; (b) why it is necessary to spoil a good bur to make a drill when there are so many sizes and shapes in the S. S. W. bur list; and (c) how either a bur or a drill "far excels" a trephine in either speed or safety. I have had charge of a large college clinic for several years, and never yet saw a trephine perforation—but know of bur perforations. Can it be that the doctor has merely "thought" on paper, and has overlooked trying practically in the mouth?

In the original contribution it was admitted that the barrel of this trephine was not long enough for all cases, and the suggestion made that it be manufactured longer for this work; but in any case it will indicate correctly the direction of any necessary supplemental boring.

In this connection it is well to note that a broken pin may readily be removed by boring carefully along and against one side of the pin, and then sawing out enough of the cement around it with a Kerr or other broach to allow of its being pushed slightly to that side, loosened, and removed.

Yours truly,

Thomas J. McLernon.

Cleveland, Ohio, October 21, 1906.

PROCEEDINGS OF SOCIETIES.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-eighth Annual Meeting.

(Continued from page 1142.)

FIRST DAY—*Evening Session.*

(Continued.)

The next business was the reading of a paper by Dr. G. V. I. BROWN, Milwaukee, Wis., entitled "The Diagnostic Value of the Central Facial Line."

[This paper is printed in full at page 1200 of the present issue of the COSMOS.]

The discussion of Dr. Brown's paper was postponed for joint discussion with that of Dr. Pullen.

The next order of business was the reading of a paper by Dr. HERBERT A. PULLEN, Buffalo, N. Y., on "Mouth-breathing."

[This paper was printed in full at page 998 of the October issue of the COSMOS.]

Discussion.

Dr. R. OTTOLENGUI, New York. I have seen much of this sort of work exhibited by Dr. Brown and have been greatly impressed by it, but I have never been more forcibly impressed than I have been tonight with the wonderful success of his operations.

The case which Dr. Pullen showed on the screen of the remarkable change and wonderful improvement after the removal of the adenoids has impressed me very much. I have under observation at the present time a most interesting condition as evidence of the results that can be worked in the face from this source. I had brought under my care about two years ago a young girl suffering from adenoids, and presenting a case of irregularity of the second class—retrusion of the mandible and protrusion of the maxilla. There came with this girl and her nurse on one of her visits, one of the sweetest and most beautiful little girls I have ever seen in my life, about three years of age, with as nearly perfect occlusion of the teeth as I have ever seen. I tried to get casts of the mouth as examples of perfect occlusion of the deciduous teeth, but she was so shy that I was unable to obtain them. She is now four years old, and developing a protrusion of the maxilla with a distal occlusion of the mandible. I had that child sent to a rhinologist for examination, and he reports that there is adenoid vegetation but not sufficient to operate upon. I can see the change that has occurred in those jaws, and yet the rhinologist says that there is not enough growth to operate upon.

Dr. H. C. FERRIS, Brooklyn. I have been greatly entertained, and not a little relieved in one sense, by hearing Dr. Brown's paper. I agreed at Dr. Turner's request to discuss it, but not having seen the paper, have been greatly disturbed as to what the essayist meant by the central facial line. I made some drawings, worked out from casts of cases of malocclusion, which was due in one instance to adenoid conditions, producing a case of the second class, and I intended to use the same, hoping to hit the mark, but I see that I have fallen flat in my conception of his subject. The beautiful manner in which the essayist has described this scientific subject represents much thought and untiring effort in preparation, and I am sure we all feel indebted to him for coming before us with the results of his studies.

Dr. Brown (closing the discussion). I would like to thank you all for the courteous attention given me during such a full evening, and especially the gentlemen who discussed the paper, for their kind remarks. I think I am particularly fortunate in having Dr. Pullen follow me with his paper, because he made clear so much that I would like to have brought out, but could not on account of the lateness of the hour.

In order to show you more clearly what I meant by the central facial line, I will refer you to Dr. Pullen's pictures rather than to my own. If you have grasped the principles I tried to make clear in my paper, I think the photographs he has shown will develop the fact that, in the first place, these individuals had a marked neurotic tendency, and whenever such a tendency exists it leads to the development of adenoids, arrest of development, and irregularity of the teeth, in common with other degenerative signs, and if you draw a line through the face of this one [pointing], you will find that one of the eyes is higher than the other. You will note the same disparity in the features—the ears, eyes, and facial lines of each picture that he has presented—showing the point that I wanted to make, even more clearly than my own pictures did.

The purpose in drawing the line I have called attention to is simply to accustom ourselves to observe these different features, in order to recognize the principle that with every individual there are certain tendencies that begin back in the embryonic stage, and that these influences of heredity, augmented by factors which develop later, such as environment, habit, muscular and other conditions, all combine to cause these troubles, and that it is an error to try to account for them wholly by such etiologic factors as thumb-sucking or similar causes. If we keep in mind the inter-relationship of facial development, we cannot avoid recognizing the fact that we have a work to do in the combating of tuberculosis. Remember that all that science has been able to do or recommend for tuberculosis may be summed up in having better air, more oxygen, more food, and better assimilation. That is all there is to it, and if that does not lie as much within our field as in that of the general practitioner, then I have mistaken my text tonight.

Dr. W. W. Coon, Alfred. Mouth-breathing, for all intents and purposes, is due either to enlarged tonsils or adenoid vegetations. In most cases both conditions are present. The other causes of mouth-breathing are so extremely rare as not to necessitate their being taken into consideration. It is a condition found more commonly by far in childhood, and usually has associated with it a congestive form of nasal catarrh, chronic pharyngitis, and very often also laryngitis. The tonsils are in a state of hypertrophy due to an increase of lymphoid and fibrinous elements. The surface is usually rough or honey-combed, and the depressions are filled with a cheesy mass composed of gland secretions, bacteria, and foreign particles in a state of decomposition. The adenoid enlargement is a papillomatous degeneration, varying in size from a grain of wheat to that of a bean. The predisposing causes are—(a) Heredity; being more common in scrofulous and syphilitic children. (b) Age; found mostly between the ages of five and fifteen. (c) Sex; boys being more commonly affected than girls. (d) Hygienic environments. The exciting cause is almost always some form of tonsillitis, either acute catarrhal, follicular, diphtheric, or scarlatinal.

According to Harrison Allen adenoid vegetations are often congenital, and due to faulty development of the vault of the pharynx. The most striking symptom of this condition is oral breathing, which is usually labored and audible, especially so at night, when sleep may be disturbed by dyspnea, due perhaps to reflex excitability and spasm of the glottis. Nightmare may also follow, due perhaps to deficient aeration of the blood. A croupy cough is a frequent concomitant. In fact, some authorities go so far as to say that all cases of spasmodic croup have for their exciting cause either tonsillar enlargement or adenoids. An excessive secretion of mucus causes the afflicted person to hawk and expectorate obnoxiously; especially is this true of those who have passed the age of childhood. Impairment of hearing and tinnitus aurium are commonly found due to pressure on the pharyngeal opening of the Eustachian tube, and may result in absolute deafness. The breath is fetid, due to the inspissated, decaying, cheesy matter in the tonsillar crypts. The facial expression is stupid, depicting corresponding disposition. The patient is usually irritable and perverse. The speech is slow and muffled, this being especially true of the nasal consonants *m* and *n* and *l*. Stammering may also be a result of these hypertrophies.

The prolonged interference with respiration causes a deformity in the shape of the thorax. The ribs are prominent and widely separated anteriorly, and very close together posteriorly, especially the lower ones. The upper part of the thorax is contracted; the different divisions of the sternum are situated at angles to one another, and the shoulder-blades are prominent. Asthma is not an infrequent complication.

Anders in his "Practice of Medicine" says that anarrheal headache—especially during study—cardiac palpitation, enuresis, and habit chorea of the facial muscles may be associated with capriciousness, mental dulness, indisposition to intellectual exertion, drowsiness, and sullen irritability. The term "aprosexia" has been given to the loss of power to concentrate the mind for any length of time, which is characteristic of these cases. This condition is not considered dangerous *per se*, but increases the liability to the contraction of various diseases. The prognosis of acute respiratory diseases when associated with enlarged tonsils is more serious, and neglecting the proper treatment of these conditions, causing mouth-breathing, tends to lessen the degree of growth after puberty.

Surgical removal of the growths is the only rational and satisfactory treatment. It may be supplemented, however, by change of air, good food, bathing, careful dress, prudent habits, and general medical tonics.

Dr. V. H. JACKSON, New York. I would like to make a few remarks on the subject. Dr. Pullen has brought before us many truths that will be helpful to all, and has presented these truths in an interesting manner. The subject is important, as the partial occlusion of one or both nasal fossæ from any cause is likely to induce mouth-breathing—a condition usually accompanied with a disease of the glandular structures in the naso- or oropharynx. There is in the posterior portion of the mouth a chain of glands known as Waldeyer's ring. These consist of the faucial tonsils, the lingual tonsil, and the third (pharyngeal), or Luschka's tonsil, familiarly known as "adenoids." The adenoids are distributed over the posterior walls of the pharynx, and usually obstruct the natural air-passage, causing the patient to breathe through the mouth.

The lingual tonsil is located at the base of the tongue. Hypertrophy of this gland occurs more commonly in the female. The faucial tonsils are arranged on the lateral sides of the fauces. Enlargement of the faucial tonsils is said to occur more frequently in the male.

Rice says that "ninety per cent. of the class of cases termed mouth-breathers are not simple ailments of catarrhal disease of the nose, but are evidences of nasal obstruction which prevents nasal respiration. This obstruction is largely due to the presence of enlarged tonsils." Chronic enlargement of the tonsillar tissue is one of the principal causes of mouth-breathing, and is a disease of child life. When any one of these glands becomes congested, it encroaches upon the air-passages. Nature in an effort to re-establish sufficient air-space causes contraction of some of the muscles. When one or both of the faucial tonsils are hypertrophied, it will be readily seen that they encroach upon the natural air-passages. This enlargement of the glands, obstructing the passage of the air, interferes with natural breathing and causes nature to resort to some means of increasing the air-space. This is accomplished in a degree by the action of different muscles, depending upon the location of the obstruction; the tonic contraction of the muscles in some instances forces the mandible forward, taking with it the tongue, and in others dragging the hyoid bone forward and the mandible backward, but causing recession of the mandible through the continued action of the muscles.

Bones are the framework to which the muscles are attached as stays. The action of the muscles in mouth-breathing causes the narrowing of the upper arch and the lateral constriction of the nares, and the arching upward of the palatal portion of the jaw further tends to constrict the apertures. It is found that in changing the conditions of the patient so that the chronic mouth-breather can breathe naturally through the nose the brain is stimulated, rendering mentally active the one who seemed stupid and dull.

Dr. Messerschmitt, Rochester, N. Y. The subject of mouth-breathing is an intensely interesting one, but one which does not receive from the general practitioner the degree of consideration to which it is entitled. As dentists we know what slight pressure is required in young patients to separate teeth, or to correct irregular ones. A very small amount of constant pressure on any soft bone will completely change its normal shape; then why should not nasal or pharyngeal obstructions, producing mouth-breathing, cause a change in the shape of the arch as well as in the expression of the face? This irregular development is caused undoubtedly by the repeated contraction of the muscles controlling the nasal orifices, induced by the forced nasal inspiration and snuffing, and also by the column of air constantly striking the hard palate, which not being counterbalanced by air within the natural passages, together with the combined pressure of the buccal muscles exerted on both sides, must have a restraining influence toward the actual and normal broadening of the maxillæ.

If time would permit, eminent authority could be cited proving that nasal and pharyngeal obstructions produce these as well as other conditions. A nose, therefore, through which during the growing years but little or no air passes, and a mouth, through which no respiratory air is supposed to habitually pass, compelled to perform the function of the nasal passages, cannot develop along normal lines. If but little air passes through the nose, the call of blood to it cannot be nearly as great as when it has to warm and moisten a normal quantity of air; consequently the entire process of growth and mucous membrane formation are bound to be influenced by the decreased blood supply; the converse is true of the mouth. If the nose be of no account in respiration, surely the mouth would be a larger, easier, and more direct inlet and outlet for the air in its passage to and from the lungs.

The purpose of the passage of the air through the nose and not through the mouth is to insure its being warmed, to close upon 100° F., moistened to saturation, and filtered from all irritating and injurious particles of dust suspended in the atmosphere, in order to lessen the chances of direct introduction of tubercle bacilli and other germs into the lungs. The normal physiological function of respiration is performed unconsciously, and repeated some twenty thousand times in twenty-four hours. The functional activity of the turbinates is ceaseless, and in proportion to their size exceeds the functional activity of any other organ of the body. It is calculated that about two quarts of water a day are given to the inspired air by this body and the lining of the nasal respiratory tract, and that all the air that enters the larynx, no matter what the outside temperature may be, is warmed nearly to the temperature of the body; and for this reason the wholesale removal of tissue from the nose—as practiced by some specialists—should be avoided, as it is very likely to produce a dry pharyngitis, and leave the patient in a much more uncomfortable condition than before the operation.

Chappel says that septal spurs, ridges, and deviations produce more or less nasal occlusion, but are not common to children under three years of age.

Kyle says that usually the pharyngeal tonsil attracts the general practitioner or specialist's attention only after the growth has become sufficiently large to obstruct nasal inspiration, and thus interferes with the development of the nasal and facial bones.

Linhart (*Laryngoscope,* March 1906) says that very young children, as a rule, have little difficulty in breathing through the nose. It is only in later childhood, subsequent to the hypertrophy of the adenoid tissue in the vault of the pharynx and the hypertrophy of the tonsils, that the children begin to breathe through the mouth. The infant from birth always breathes through its nose, and keeps its mouth closed during sleep, providing there be no local obstacle to nasal respiration.

Chappel says that during a recent examination of 437 children under three years of age, there were 45 under seven months of age who had some nasal obstruction, but in no child under three months was the obstruction due to lymphoid hypertrophy in the naso-pharynx. In fact, in his experience he has been unable to demonstrate, to his satisfaction, the presence of adenoids in such young subjects.

Hall, in his work on the Nose and Throat, says that adenoids would seem in some rare cases to be congenital, but that no dissection of newborn infants had confirmed this theory. Some years ago he made a number of post-mortem examinations on newborn infants, but found no case of adenoids, and thinks that this evidence is rather against the congenital theory.

Cohen and Allen have called attention to the fact that possibly the dull mental condition is due in some cases to alteration in the circulatory relation, either lymphatic or vascular, between the brain and the naso-pharynx.

A large quantity of unhealthy mucus finds its way into the stomachs of patients suffering from these conditions; in the child it no doubt interferes with nutrition, and in the grown person may be the cause of dyspepsia. The want of proper oxidation at night is the probable cause of the altered and damaged complexion. The dental practitioner should become familiar with this pathological condition, so as to be able to give intelligent advice to his patients regarding these conditions, for when the operations are performed at an early age better results can be obtained, and in addition the patient is more easily broken of the habit of breathing through the mouth. However, obstinate cases of this kind can usually be corrected by proper breathing exercises.

Dr. PULLEN (closing the discussion). It is certainly a happy and significant coincidence that Dr. Brown's paper and mine should have been read successively, since one seemed to supplement the other, both in the context and illustrations. There is no doubt that a broader insight into the fields of oral and plastic surgery, rhinology, and orthodontia is obtained by this means, and the intimate relationship between them is very markedly illustrated. Dr. Brown has very conclusively shown the hereditary phase of imperfect development of the intermaxillary bones and plastic tissues of the naso-maxillary region, and his post-operative results prove him a skilful rival in the field of facial art.

My paper could be said to begin where Dr. Brown's concluded, inasmuch as it dealt with the pathological conditions found in the child some years after birth; and the idea which he suggested of there being a congenital diathesis in cases presenting the conditions I described is not at all out of harmony with the etiological characteristics of malnutrition and deficiency in development, as he has gone a step farther backward and shown the very beginning of developmental neurosis which in later years might result in varying degrees of insufficiency of vital function of the entire organism.

Dr. Jackson's theories regarding the action of the muscles in mouth-breathers being on an abnormal or unequal tension, and thereby causing certain definite forms and abnormal relationships of the arches, are very interesting, as well as is the chapter in his recent book which deals with the etiological and pathological characteristics, associated malnutrition, nasal stenosis, and defective development of the arches. The discussion of Drs. Coon and Messerschmitt, although presenting some interesting statistics, were mostly repetitions of many of the points brought out in my paper, due no doubt to the fact that they were not furnished with copies of my paper in advance of its reading, so that they might have had some opportunity for perusing it beforehand. I owe an apology to the gentlemen who were scheduled for this discussion for my neglect in this matter. I regret that the lateness of the hour will not allow of a general discussion of this subject.

The society then adjourned to 9 o'clock Saturday morning.

(To be continued.)

CONNECTICUT STATE DENTAL ASSOCIATION.

Annual Convention, Bridgeport, Conn., April 18 and 19, 1906.

(Continued from page 955.)

TUESDAY—*Evening Session.*

At the evening session the association listened to an address by Dr. J. C. MONAGHAN, Washington, D. C., chief of the division of "Manufactures," Department of Commerce and Labor, on "The Duties of Professional Men in a Republic."

After the address by Dr. Monaghan, the members and guests were entertained at a smoker.

WEDNESDAY—*Morning Session.*

The meeting was called to order by the president, Dr. Griffith, at 10 o'clock Wednesday morning.

The first order of business as announced by the President was the reading of a paper by Dr. J. E. NYMAN of Chicago, Ill., on "The Status of the Profession," as follows:

THE STATUS OF THE PROFESSION.

If an individual's own welfare is a matter of any concern to him, then too a matter of concern to him should and must be the status of his profession. It is a demonstrable fact that the first condition is largely governed by the second. Conversely, it is true that the second condition is in large degree determined by the individual.

It is said that "A nation is an aggregation of individuals, and that which is true of the individual is true of the nation." So too, "A profession is an aggregation of practitioners, and what is true of the practitioner will be true of his profession." Thus we have a reciprocal influence to consider affecting each one's mental, moral, and material welfare, which should arouse our most serious interest.

The status of our profession is a matter of public opinion, which latter will be but the composite opinion of each patient. The public is always ready to accord to any man, or any body of men, the esteem and the reward that they merit; there is no necessity of clamoring for it; indeed clamoring will only jeopardize the bestowal of that which is desired. We shall receive what we command, rather than what we demand.

The status of anything is of course a comparative proposition. Our profession will be adjudged with that of medicine. If dentistry shall continue to be regarded as a profession wholly distinct from that of medicine, then it must not be expected that it will ever be regarded as equal to that of medicine or the law, for there is seldom the same gravity of possible results about it.

The public regard the physician as the one who stands between them and suffering, disability, deformity, and death, and they are bound to regard with great esteem and respect the one who protects them from such dire eventualities. They regard the lawyer as the one who stands between them and the loss of avocation, property, liberty, and even life; and they hold in high regard him who can deliver them from such a fate. They approach members of these professions filled with apprehension lest some of the calamities that they feel menace them shall actually befall them. Furthermore, there is so much uncertainty, there are so many miscarriages of both medical prognosis and legal opinion, so many failures in the two professions just referred to, that he who is successful is regarded as little less than a savior.

Seldom, however, does one feel that any dental affliction involves permanent deformity, disability, or death. The very fact that we have perfected the science of our profession to the point of almost absolute certainty of successful results in its practice, and the fact that of all the substitutes for the natural organs of the body, the most perfect are those for the dental organs, which almost invariably fully restore normal appearance, form, and function, have in a measure lessened public appreciation of our profession.

The certain success of dental operations has come to be regarded as a matter of course. That which is regarded as a matter of course is never given full appreciation. Paradoxical as it may seem, the perfection of our art and the certainty of our operations have in a measure depreciated the status of the profession by dispelling the fear of direful permanent results of disease and injury in the field of our practice.

Still there will be another estimate considered by the body politic in determining the status of our profession, quite apart from that established by comparison with that of medicine and the law, and that will be: the question of the necessity of our services to mankind, the benefits derived therefrom, and the evidence that our ability and our judgment are the result of a high-grade education, and of long application in the mastery of the theory and technique of our art.

Personal suffering from disease and accidental injury in large degree convince the public of their necessity of our services. The results of our labors are proof sufficient of the benefits we bestow. The evidence of a special grade of education and of long endeavor we ourselves will manifest or disprove in many ways, direct and indirect, consciously and involuntarily. What then are the factors which operate to fix the status of our profession? They are of two classes—specific and general; those exercised by the individual practitioner (which are the more potent), and those exercised by the societies of the profession.

Specific factors will be the evidence on the part of the practitioner of ability, of resource, of honesty, of esteem for his profession, of education, and of culture. Yes, of culture; for that always suggests all these attributes blended with a fine dignity. The *Lancet* recently stated that even as it was a century ago, still is it true today, that "A certain fine dignity of appearance and action is the most potent factor of success in the career of a professional man."

Do not imagine that I mean that exaggeration of ponderous dignity which has been affected by the quack for so long that it has come to be regarded as the cloak of hypocrisy and incompetence. There is a poise based on ability, honesty, and refinement, that results in a certain dignity which is unmistakable, but which is not awesome and without affability. You know what I mean, and the people recognize it when they see it. Of two men of equal ability, the one with this fine dignity will be the one who receives the larger fees from the same class of people, whose services are the more sought after, and who has the least annoyance in the conduct of his practice. Indeed, both you and I can recall instances of a man of inferior ability who has held his own with a more able man, because he exhibited a certain fine dignity of appearance and action, while the other did not.

This dignity is synonymous with refinement and culture. How shall a man evidence it? In his sense of propriety, his value of proportion; in his dress—even to the color of his scarf—in his cleanliness of person, in the furnishings of his office, the pictures on his walls, the books and magazines on his reception-room table; in his ability to converse about things classical, and to discuss logically and convincingly events and questions of the day.

It is the policy of wisdom to dress well, and to wear an air of prosperity before the public, even if one has to practice almost painful economy in private. Have you ever stopped to think of the suggestion of prosperity that goes with polished shoes, clean linen, and well-manicured finger-nails? The margins of our make-up are as critical points as are the margins of our fillings. The care of one's fingers and nails is as essential as the care of one's beard and hair. The furnishings and decoration of our offices convey a strong psychological suggestion to a patient. Avoid an exhibition of extravagance; a patient is quite apt to imagine that your fees are extravagant too. Better one good picture on each wall than four times as many mediocre ones. Better a simple photogravure of some fine painting than a real painting of inferior quality.

Do you feel yourself incompetent to direct this furnishing and decorating yourself? You will find it will pay to confer with some expert connected with an establishment devoted to this work, telling him frankly what you can afford to so invest.

For your private office I know of no better decoration for its walls than the photographs of your professional friends; they will be a source of comfort to you; a glance here and a glance there will bring to you pleasant and inspiring reminiscences, while to the patient they will convey the impression that you are a man of wide acquaintance in your profession, hence a man of ability.

I know of nothing that better equips one to converse of things classical than the reading of books. Classical does not necessarily mean antique; classics in the fine arts—music, painting, sculpture, and literature—are being produced week after week in this present time. The classics furnish as entertaining reading as do the trash of literature, no matter whether your predilection be for stirring romance, humor, or profound philosophy. Do you feel yourself incapable of making selection? Then read the book reviews published in the daily papers and monthly magazines, instead of wasting your time on the details of the breaking of the automobile records: a glance at the headlines will suffice for the latter.

Go to the exhibitions of painting and sculpture that occur every little while. Attend every fine concert that you can. Attend the illustrated lectures of travel. Do these things, even though at present you do not find an attraction in them. You will at last acquire an appreciation; there will develop an attraction; you will add to your education.

To equip yourself to intelligently and convincingly discuss important events of the day or questions of policy that are the subject of great concern, read the editorials of the daily and weekly papers; take two papers of the opposite political creeds, and read both sides. Read the signed statements of special investigators and correspondents. Take for instance the prominent questions concerning the Panama Canal. I wonder how many of us have read Frederick Palmer's "Panama Without Prejudice" in *Collier's Weekly,* or Dr. Rowland's "The Truth about Panama" in *The Booklovers' Magazine.* Have you read "The Cry of the Children," by Marie Van Vorst, and "The Looting of Alaska," by Rex Beach? They are articles that every citizen of the country should read. These instances might be multiplied many times.

Concerning ability, a man will involuntarily demonstrate the fact if he has it. As to honesty, he will practice it if he is wise, even if his conscience does not impel him to. No matter how tolerant a person is regarding honesty in the dealings of a man with a corporation, a legislative body, or a committee, he is insistent when it comes to personal dealings with himself, and is unforgiving if he finds it has not been accorded him. Furthermore, the dishonest man in a profession is usually classed as an incompetent man as well. The esteem the public have for us will in large measure be a reflection of the esteem which we evince for one another and for our work. As a fine old gentleman of our ranks has laconically put it: "We need not expect the public to respect us, if we do not respect one another."

Never yet did a man sweepingly criticize another, but what he weakened his hearer's confidence in himself.

Never jest about your profession, or complacently permit your profession, or yourself as a professional man, to be the subject of jest and joke. You may make silent but evident protest at the time such humor is attempted, by the expression of your face. Then seek immediate opportunity to privately inform the jester that your life-work is a most serious matter to you, and that you cannot consider as an appropriate subject for jest a calling which you have spent years of your life in fitting yourself to practice. Tell him you are quite willing personally, but not as a professional man, to be made the subject of jest if it be necessary to so amuse the gathering, but that you do not desire your profession to be treated as a matter of amusement. If the person be a man of intelligence he will realize that what he did was thoughtless and inconsiderate; he will understand the motive of your protest, and both you and your profession will be exalted in his opinion.

If after such an admonition the same jester repeat the offense, then you are warranted in resenting it as a personal affront, and in administering to him a public rebuke, as stinging as your brain can formulate and your tongue utter. If you sit complacently by and join in the mirth following such a jest, can you not see that those present will conclude that there is little to esteem and value in either you or your profession, since you who are a member of it treat it as a matter of sport? You yourself will be regarded as too frivolous a man in whom to place any degree of confidence, since you laugh at your life-work; and let me remind you that in the confidence placed in you as a professional man lies your main chance of success.

Many of the public have still somewhere in the backs of their heads a reminiscence of the fact that once much of the dentistry was done by the barbers, and occasionally this comes to the front, and evidences itself in some such episode as this:

Jones of our profession meets Brown, of the law. They are introduced.

Brown. Glad to meet you, doctor. Yes—in general practice are you?

Jones. No, I'm practicing dentistry.

Brown. Oh, a dentist. (His tone plainly indicating that Jones has dropped in his estimation.)

Perhaps I may be permitted to give personal advice concerning such an episode. The next time such an inquiry comes to you—as it will—reply that you are practicing a specialty of medicine. He will ask, "What specialty?" Answer, "That of dentistry," and look him steadfastly in the eye. Your response will surprise him, and he will make some questioning comment on it. This will be a fine opportunity to enlighten him, and to impress upon him that your profession is very closely allied to that of the physician and surgeon, and is quite as scientific and beneficent. And in the mind of that person the status of our profession will have risen several degrees.

There are some things one should avoid because they are recognized insignia of a class we do not wish to be associated with. To still further eliminate the association of the dental office and the barber shop, I would suggest that we discontinue the operating jackets, which are manufactured with the intention to sell them to both dentist and barber.

Long gowns of washable material are far more sanitary, and suggest rather the medical man than the barber. I do not mean gowns such as the surgeon wears at operations, but those made to fit something after the manner of a long-skirted military coat, which protects the trousers and gives a suggestion of surgical cleanliness. Already these coats are being worn by both physicians and dentists, and manufacturers will shortly have them on the market. The force of suggestion of cleanliness must be self-evident.

Exercise all the self-control at your command to avoid displays of sudden wrath, especially such as angry censure or abuse of a third party in the presence of a patient, no matter how exasperating the provocation may be. Such outbursts are indicative of a weak character, of an inability to master circumstances and control them. There is a vulgarity about such affairs that lowers you in the estimation of any discriminating patient. Frequently there is injustice too—apparent to the patient perhaps at the time—which you yourself become aware of only when the period of passion is over; and to the suggestion of vulgarity has been added that of faulty judgment. Passion always constricts the field of vision, mental and physical, and circumstances that might mitigate the blame are usually unobserved. If you must censure severely, wait until there is no third party present. By that time you will probably be in full possession of your faculties, and mete out just what is deserved. Most of the historical mistakes of the world have been those made in an outburst of anger.

Perhaps all this may seem petty advice, but trifles sometimes sway important things in a sadly forcible manner. The suggestions conveyed by environment and manner are of the unconscious influences of life, and the enduring force of unconscious influences lies in the fact that they are subtle and sincere. Dignity and culture have a commercial value because of their mental influence, aside from the respect they procure. One with those attributes is free from petty impositions that worry and fatigue. Men do not impose on one they respect and esteem.

I have previously stated that I regard dentistry as a specialty of medicine. It is the most highly specialized specialty of medicine. How any unprejudiced thoughtful mind can otherwise conclude after careful study of this proposition is difficult to comprehend. Given the definition of medicine, as "the art and science of prevention and cure of disease, correction of deformity, and repair of injury in the human body" as a premise, how can any other conclusion be logically reached?

It is noticeable that most of the opinions to the contrary come from men controlling dental colleges, or occupying positions on boards of dental examiners, and it would seem as if their position were due to an apprehension that a conclusion that dentistry was a specialty of medicine would result in the abolishment of dental colleges and boards of dental examiners, rather than to logical deduction. Such apprehension is entirely misapprehension. Even if all the professions, the press, and the public did recognize such a relation between medicine and dentistry, there still would be the necessity for dental colleges and boards of examiners, and still would they continue to exist.

There is little danger that a physician would attempt to practice dentistry without having prepared himself to do so by special study and technical training, or that a dentist would attempt to practice general medicine without fitting himself to do so. The degree of M.D. permits a man to devote himself to the specialty of ophthalmology and otology, and yet few —very few—attempt such a thing without acquiring the special knowledge and mastering the special technique requisite to such a practice, and this is true of other specialties of medicine. Few men are so foolish as to attempt that which they know they are incompetent to perform. In this lies the safeguard of the people as much as in the laws.

To recognize such a relation would not more freely expose the public to imposition than now obtains. Legal restrictions cannot eradicate impositions. The impostor will prostitute any profession in which he is licensed to practice, be guilty of as much malpractice, and be as great a menace to the public in one profession as in another, and this in spite of any law that can be framed and executed.

Fortunately impostors have methods of announcing themselves to the public that are so distinctively characteristic of the charlatan that only the indiscreetly credulous and the ignorant are ensnared, and to protect them they would have to be placed under restraint, which would be a violation of the liberties guaranteed by the constitution.

The trend of events shows clearly that such an affiliation of medicine and dentistry is being established by the slow but absolutely certain process of evolution, despite the scattered opposition of a certain number of individuals. More and more extensively and thoroughly are the fundamental branches of medicine being taught in the dental schools and more medical branches added to their curriculum. More attention is being devoted to dental pathology in the medical schools. Ultimately, perhaps there will be but the one degree, although with the restriction of a special license to practice certain specialties of medicine—including, for instance, ophthalmology and otology as well as dental surgery.

Already has the medical profession recognized this relation by the establishment of the section of Stomatology in the American Medical Association, and the section of Dental Surgery in the British Medical Association. Our profession would do well to foster this spirit of closer association. It will enhance the status of our profession, and much mutual benefit to both professions result therefrom.

The dental profession would do well to proffer its moral and financial support to the medical profession in many of the projects for the welfare of the people that they are now endeavoring to establish by education of the laity and by legislation. Gladly in return would the medical profession come to the moral and financial assistance of the dental profession in the promotion of similar measures. Think of what it would have meant to have had the aid of the medical profession as a body in the effort to establish dental surgeons in the army and navy—a provision of which there was great necessity and the motive for which was a desire to provide for a great need, and to increase the efficiency of both branches of the service, and not for the profit of the profession. The country has profited, for the efficiency of the army has been increased, while there is not a dentist in the army corps but who could earn a larger income and obtain more of the comforts of life in a private practice.

Of what great assistance would have been the co-operation of the medical profession in the endeavor of our profession to secure the adoption of adequate state laws to regulate the practice of our specialty?

The suggestion that members of our profession should join the Stomatological Section of the American Medical Association is worthy of great consideration, and should be accepted. It would not only be beneficial, but would show the proper appreciation of the manifested attitude of the medical profession toward us. It would do much to place us where we ought to be in the courts of the land, that is, on a par with the physician, the lawyer, and the clergyman, in exemption from jury duty. Every argument for special privilege in the case of these three professions applies with equal force and cogency to our calling, and it is time that a serious systematic effort was made to reverse the obsolete and illogical rulings of the judiciary in this matter. Think of what the support of the medical profession would mean in such an endeavor, and how easily it could be accomplished if our calling were accepted as a specialty of medicine.

Man never accomplished anything until he began to associate and co-operate with his fellow man, and then the possibilities of life came to be apparent, and by concerted effort were transmuted into the tangible utilities and comforts of life. The value of association and co-operation is as great as ever it was, and as productive of benefit to both individual and society.

The power of state societies could be greatly increased by the institution of local societies and their close affiliation with the state society, as has been done in the state of Illinois, where the state society has increased its membership four hundred per cent. It has fifteen hundred members, comprising fifty per cent. of the profession in Illinois, and has become a body of such importance that its opinion is of great weight with both the legislative and executive branches of the commonwealth. This same suggestion applies to the National Dental Association, an institution that should be to our profession what the American Medical Association is to that of medicine.

Have you ever stopped to consider the attitude of the public press toward us, and the impression thus made as to public regard? Their news items concerning our meetings are a matter of jest, accompanied often by ridiculous cartoons, inspiring a similar feeling on the part of the laity. How their mention of our meetings differs from those of medical meetings! My attention was especially directed to this matter recently by a journalist, who inquired why our dental societies had never corrected this matter by appointing a press committee to confer with the managing editors of the prominent papers, and arrange for a dignified, accurate, and intelligent report of our meetings. He assured me that the managing editors of the influential papers were intelligent, considerate gentlemen, who would appreciate and accede to such requests if properly presented. Why should this not be done?

Men of the most convincing power of manner and speech should constitute these committees, for it is really a matter of much importance.

Would it not serve to elevate the status of our profession if at the annual meeting of each state society every paper of importance in that state published such a report as has been suggested, and if at the annual meeting of the National Dental Association every paper of importance in the country did likewise?

Why has not the fact that the national medical associations of America and England have—by the creation of dental sections in connection with their associations—recognized our status as equivalent to theirs, and our calling as a specialty of medicine, been promulgated to the people through the medium of the public press? Think of what an uplift that would be for our profession in the estimation of the laity.

The establishment of an official journal of the National Dental Association, published by the association, modeled after the *Journal of the American Medical Association,* would add to our standing with the medical profession. There is a perfect surfeit of dental journals these days. We are being stuffed with them beyond our ability to digest and assimilate. Every supply house that has capital to do so is publishing a dental journal, and the publishing department is now regarded by these concerns as a purely commercial factor, as essential as the sales, bookkeeping, and shipping departments, and as a result, the character and influence of our current literature has depreciated. The editors of the journal should be the priests of the profession, and by impartial publicity and unprejudiced advice should right wrongs, correct errors, and lead the profession on to better things. Great injustice has on occasion been done by elaborating one side of an honest controversy and withholding all mention of the other.

The weekly publication of a journal such as has been suggested, edited by capable men of our profession who should be paid salaries for their services, would be of great benefit to dentistry.

The recent action of the National Association of Dental Faculties in fixing a full high-school course or its equivalent as a standard of preliminary education essential for matriculation, will have a marked influence in uplifting the status. Professional colleges should be a part of and under the control of some recognized university, and those that are stock corporations, wherein the stock is owned by one man or a few men, should not be countenanced or recognized. Professional colleges have multiplied beyond any necessity for them, and it cannot be denied that—in many instances—they were instituted for financial gain or from a motive of retaliation; and in the effort to secure students and develop infirmary clinics, subterfuge and deception have been known to be practiced. Much of the hostility between colleges, and between the colleges and the state boards, has thus been engendered. It would seem that it must be possible for the National Association of Dental Faculties and the National Association of Dental Examiners to meet on some common ground, and work in harmony with one another for the good of all. Personalities should be subordinated to the common good. Those who take an antagonistic stand, based on personal animosity and without regard to the principle involved, should be simply squelched. Both associations are so strong and widely representative that neither can dominate and dictate to the other. Why not recognize this, and meet one another half-way, fairly and frankly, and, having an amicable, honorable compromise, both associations work in unison for the common good?

I would have every graduate in dentistry go forth from his college thoroughly impressed with the important influence the status of his profession has on his welfare, and with the realization of how important a factor the individual is in determining that status.

Every college should provide for a course of lectures on ethics and the conduct of a practice, to be delivered to the seniors in the last term of their course. Not the usual dry, moralizing, perfunctory addresses; the cleverest, brightest, most convincing lecturer that could be procured should be the man for the work. His lectures should be a source of entertainment as well as of instruction. Of course, to begin with, the students would have to be forced to attend them, but if the proper man were chosen and the lectures were what they should be, they would become a tradition handed down from one class to another, and the classrooms would be crowded, the lectures looked forward to, and the graduates go forth with a fuller sense of their responsibility in advancing the status of their calling.

Our profession is an honorable one. It has a scientific basis. It is a factor for the welfare of mankind. Among its number are poets, artists, sculptors, authors, orators, inventors, and scientists—men who rank with the notable ones of any of the other professions. Its status should be the concern of all.

Discussion.

Dr. T. J. Barrett, Worcester, Mass. Dr. Nyman presented a new idea to me when he said that dentistry was so essentially a specialty of medicine that the schools of dentistry and the state boards were somewhat in danger of absorption by the medical profession. I never thought of dentistry in that light before. Dentistry is so different as a specialty from medicine that it never could be taught as the latter is. It is so dissociated from it and yet so closely associated with it, that it will always be necessary to have separate colleges in which to teach it, and separate boards to judge of the fitness of the candidates to practice it. On the theoretical side we are closely associated with medicine, while on the practical side our profession is so foreign to medicine, that I do not believe the time will ever come when the medical profession will undertake to absorb dentistry.

The essayist's contention with regard to stock colleges is an old theme of mine, as it is a subject on which I have talked many times. I believe the time is coming—and it is the duty of the profession to hasten the day—when stock colleges run for private gain shall be blacklisted, and then young men entering the study of dentistry will be warned against them. And I think that is a time dentists may look forward to with much pleasure, especially those who are interested in the upbuilding and uplifting of the profession. We cannot be encouraged to devote our time and efforts to the elevating of our profession while some of those who are entering it today are invited into its folds by a low class of colleges which are run for private gain. This has grown to be such an evil that the Faculties Association has at last recognized it, and has adopted a rule which requires a high-school course for matriculation in all the colleges. This will be lived up to by some of the colleges, while in others many students who have not this required education will be admitted under some subterfuge. That has been the history of the past, but it may not be so in the future.

As to the position of the essayist with regard to the National Association of Dental Faculties and the National Association of Dental Examiners, I believe with him that strenuous action on the part of one toward the other is bad. It would be better for them to work in harmony and co-operate one with the other. In my experience with examining boards I have sometimes suspected that they are examining the students from a higher standpoint than the colleges were educating them to. Examining boards as I know them examine students as to whether they are safe men to admit to the practice of dentistry, and it seems to me that in examining students the boards should expect from them only what should be expected by the colleges from the students when they are graduated, viz, that they are safe men to allow in the field of practice. The colleges have no right to graduate students who in the judgment of honest teachers are unfit to practice dentistry with safety to the public. And I submit to you, gentlemen, that they do pass such men out into the world to practice dentistry. I will say that in times past nearly fifty per cent. of the entire college output were unfit to practice when they passed from the hands of the colleges. Now, this is a sad condition in dentistry, and the good teachings of men like the essayist, engaged in the uplifting and upbuilding of our profession, are being offset thereby. You cannot elevate and uplift the profession so long as that condition exists. You cannot inspire the public with confidence while men who are unsafe and unfit to practice are being graduated and granted degrees to do so by the so-called dental colleges. I believe that that is the root and branch of the evil, and until that is eradicated I do not see immediate prospects of any great improvement in the general conditions of dentistry. I am not ready to agree with Dr. Nyman that only the output of the universities should be recognized; but I do agree with him that we should eliminate the stock colleges that are run for private gain.

I have submitted this proposition before, that is, I do not believe any dental college should exist for private gain and for the financial benefit of any set of individuals. I believe most teachers of dentistry today are underpaid, and further that the man who devotes his time to a college for teaching dentistry should be well paid; that the colleges should employ only able, conscientious teachers, and that these should undergo some special training for such responsible positions. They should be well paid, and after that has been done and the necessary running expenses of the colleges paid, my idea is that any earnings beyond that point should be reinvested in the development of the colleges for higher education, and should not be a matter of private gain for the individual, or set of individuals, who conceived the idea of building and operating the college.

I do not wish to be considered as taking an unfair stand or an unfair advantage in regard to stock colleges, but I believe the day for their existence is passing. We do not need in this country sixty dental colleges, as the people are not suffering for dentistry. There is a demand for good dentists—for better dentists than we have now, and for dentists who will strive to build the profession up to the point where Dr. Nyman describes and desires it. Then we would not fall in the estimation of any man when we were known to be dentists. The reason for this is that there are so many inferior men in the profession—so many "fakirs" in it. And I ask, how can we get rid of them when we have "fake" professional men running "fake" institutions? Why, gentlemen, it is the most natural thing in the world that their products should be fakirs. Some students go into the colleges and see the infirmaries receiving great incomes for inferior work, and they say to themselves, "Let us go and do likewise; we can do it on a small scale, and we will do it for what there is in it. We are engaged in dentistry to make money; never mind the fellows who attend society meetings and call themselves ethical, perhaps they may be a little more cultured than we are, but we are in this business for the money there is in it."

Dr. Nyman's reference to the trade journals and supply houses is timely. I think these are impositions upon the profession. We do not find other professions overburdened with supply houses bearing down upon them and combining to take all they can from them. It is true that they do not require so many tools and instruments as we do, but what they require they can go into the open market and buy, and I wish we could do the same. The medical profession is not obliged to support the supply houses that we have; no trusts, no combinations to keep in condition to pay fat dividends. Our supply houses undertake to establish and justify their combine with the efforts and influence of their journals, and we are over-stocked as a profession with their ideas. I think the time has come for the profession to take a determined stand in this direction and shake some of them off.

In closing I want to say that I enjoyed the paper very much, and I am sure that it will be well worth reading by every member of our profession when it is published.

Dr. JAMES McMANUS, Hartford. I do not know when I have listened to a paper treating of the status of the dental profession in which I have been as much interested as I have in the one we have just heard. I have no fault to find with the colleges generally, and do not make any sweeping statement or assertions against them. Where would dentistry have been today were it not for the first college, the good old Baltimore College of Dental Surgery, which was a stock college? The establishment of dental colleges was entirely without the aid of the medical colleges or universities, but when they saw that there were from four hundred to one thousand students in the dental colleges, with the prospect of a yearly increase in numbers, the medical colleges and universities began to think that they had better gather them in, and the medical men began to respect the men who were the creators of these stock colleges—as my friend Dr. Barrett calls them. Some of these colleges may be—and I have not the slightest doubt that some of them are—run on different methods from what they should be, but in the past they have done much good, and they are forcing the medical colleges and the universities to a higher standard.

There is nothing that my friend Dr. Nyman said but what I can indorse and enjoyed hearing, but when you think of the dental profession as a profession—that it is supposed to date from about 1839 or 1840 when the Baltimore College of Dental Surgery was established; when you think that there have been medical schools all over the world for ages; when you think of the short life of dentistry as a profession, and take the graduates from these different colleges and place them side by side with the graduates of the medical colleges, I claim that the dental student leaving the dental colleges today, even the poorest of these colleges, will stand on a par with the graduates from the medical colleges. I do not believe that the graduates from the medical colleges, taken throughout the country, are better fitted to treat disease than the dentist is to perform dental operations. When the young man comes out of a medical college, he has almost entirely a theoretical education, and knows very little of the practical side of treating disease except what he sees in the hospitals; but the dental student has the opportunity of observing a great many operations and the opportunity to perform them, and although many students may not have the ability to pass the examining boards, they are capable of doing the ordinary work of dentistry. There may be other reasons besides actual ignorance which prevent their passing the examinations of the boards, and I think many of the men who have gone before examining boards and have failed to measure up to the standards of these boards are competent to do the ordinary work of the ordinary dentist.

The status of our profession is, or rather should be, the status of its leading members, and when you look back and think of the men of the years past who are known the world over as dentists and also as scientists, and known as men of culture and literary education, I think the dental profession has much to be proud of. I would like very much to see the standard higher than it is today, but considering the age of the profession, I think dentistry stands very well before the world. We have, and will have in the future, plenty of opportunities for upbuilding and uplifting ourselves as a profession, and I think we are gradually doing it. If hereafter it will be difficult to enter the profession of dentistry without first going through a university, then dental education will naturally produce better educated dentists than those of the past; but unfortunately, as the result shows for the last ten or twelve years, a large number of the young dentists from these colleges who go out into dentistry have not as a rule been interested in the dental societies. In the past fifteen or twenty years the National Dental Association has not increased in membership very much. Today I do not believe its membership numbers five hundred, and there are thirty-two thousand graduate dentists in this country. For a number of years these graduates, as a general rule, have not been coming into the state societies and pushing ahead to gain membership in the National Dental Association. There is something wrong somewhere. Whether it is in the college education, or whether it is in the influence of the older dentists over the young men; whether the older dentists have not encouraged the young men properly, or whether they have not been invited by the older men to join the societies; no matter what the cause is, they have not come in. Take this state, with five hundred or more dentists, and see our membership. We all know the great advantages and benefits that have been derived from our society, and we know that it has created a better feeling, a more harmonious feeling among the dentists of the state; we know that it is improving very much, but we also know that there is room for considerably more improvement.

There was one feature in the essayist's paper which impressed me very much and to which I would call your attention—the matter of a press committee. A few years ago we had a press committee in the society, but it has been dropped, and in recent years there has not been as much interest taken in that feature of our meetings as there should be. I think there should be such a committee, composed of the best and liveliest young men in the society. I read the Bridgeport papers here last evening and this morning with much interest and pleasure. It was pleasant to see that their reports and headlines were different from what they were a few years ago. It was not that the "Tooth-pullers are Holding a Convention in the City," which has been one of their stock headlines. The reports, too, in the papers have been good, one morning paper giving quite an acceptable account of the lecture last night. This will have its good influence on the people of this city and state—and what we need is to have our affairs more generally brought to the attention of the public. We also need to conduct our meetings in such a way as will enlist the interest of the press sufficiently to insure the publication of such reports as we should have.

Again, as I said, the status of the profession depends entirely on the individual character, culture, and ability of its members.

Dr. W. D. Tracy, New York, N. Y. The essayist speaks of the relative positions of the medical and dental professions in the estimation of the public. Of course, taking the position of importance that the medical man enjoys, dealing with life and death as he does, it is natural that the public at large should look upon the physician as their dearest friend in time of need, and I myself think that the conscientious, honest practitioner of medicine, conducting a full practice to the best of his ability, occupies one of the most exalted positions that a man could occupy; and along this line, of course, the dentist is limited in the scope of his work.

I admire Dr. Nyman's optimistic trend of thought, but I do not think that I am ready to go among my friends and say that I am a specialist in medicine. I am not; I am a dentist. I never had a medical degree; I only wish I had, but I do not think I am a specialist in medicine. The utopian idea of the dentist being a medical specialist is something I look forward to, and I hope that we may live to see many men in our profession holding the M.D. degree. Those who hold this degree and practice dentistry are practicing a specialty of medicine; I am not. Furthermore, I do not believe in the surgeon's frock, and I do not believe in the white enameled office, and a lot of unnecessary fixtures to frighten patients, causing them to think they are in the surgical ward of a hospital. I want my office to be a place for the convenience and comfort of my patients, and so long as I remain in the practice of dentistry, that is the way it will be arranged.

The essayist speaks of the past history of the profession: I believe we should think and speak reverently of our early history, because we owe so much to the past. We are standing on the firm foundation laid by our forefathers. By their suffering and hard work, by their study and earnest efforts, they have established dentistry on the firm foundation upon which it now stands. We are, however, making rapid strides in our development, and will probably continue to do so indefinitely. Dentistry is yet in its "swaddling-clothes" as compared with medicine. Our development has been so rapid that the day is not far distant when we will be more important in the eyes of the public and of medical men. Physicians are beginning to realize now that they can do their work better with our aid than they can without it. Dr. Nyman also told you that he was neither a preacher nor a prophet. Now, I claim that he is both. He has preached the best preachment today that I have heard in a long time, and he has prophesied some things for the future that we will all see come true. He also speaks of the commercial value of dignity and culture. Those of us who know Dr. Nyman know that he does not mean that literally, so I will not take up that phase of the question. Dentists have occasionally, however, put on the sham cloak of culture and dignity, because they knew it would help them with their work among a certain class of patients; but dignity and culture should be gained for your own satisfaction and not because of their commercial value, and also for the sake of the joy that comes from living your life in an atmosphere of refinement and culture.

Speaking of the evolution of dentistry, and also of devoting time and money to research, interests me to the point of asking the president to allow Dr. Kirk to tell us of the Carnegie Institute, and what effort it is making to have our profession co-operate with the medical profession in following out different lines of dental research.

Dr. H. W. GILLETT, New York, N. Y. We hear so much tommyrot about the status of our profession, and so much that is of little value that I appreciate very much this paper by Dr. Nyman, and believe that it is a classic. When one-third of our profession are cultured gentlemen and loyal to their profession, doing their share of the charity work of the world—their share as compared with the other branches of arts and sciences—we shall secure all the recognition we want. I like Dr. Nyman's characterization as I heard it in one of the first sentences of his paper, but I would change one word in it. He said we will get the recognition from the community that we demand, but I would say, we will get not what we demand, but what we earn. Labor unions receive recognition because they demand it, but we cannot get it that way.

I want to amplify one or two points brought out in the paper:

First, loyalty to our profession. When in public stand by your profession and your professional brother, and when you go into society work, if he is going wrong, be loyal enough to show him where he is at fault. I think much of my friends in the profession, but I love and respect my profession more than I do any man in it. When I see my brother member going astray, I try to push him over the other way a little; and I want him to reciprocate in kind.

Second, charitable work. I want to mention one point in this connection. At a banquet which I attended recently I sat beside a gentleman connected with the New York City Hospital, and he asked me how much I thought the medical profession in greater New York was doing annually in charitable work, estimated at tenement fees—that is fees not to exceed one dollar per visit. I had not the least idea, and I do not think any of you would guess it correctly, but his answer was sixteen millions of dollars annually. Dr. Nyman conveys the idea that we have attained pretty nearly perfection in our field. Well, gentlemen, the developments of the last six months are beginning to make me feel that I knew little about dentistry a year ago, and I expect the developments of the next six months are going to make those of the last look small. We are only just beginning to realize the importance of our work and our duty to the public. How many of the diseases that the medical profession are handling today are dependent upon nutrition?—indeed, in how many of them is malnutrition the sole cause? We are standing guard over the beginning of the nutritional process. Our function is, first, to prepare the apparatus which will start digestion properly, and secondly, we have a function to perform which we have not been exercising properly. We should teach our clients to start digestion properly; how to rightly prepare the food before it enters the digestive apparatus, so that it will be in a fit condition to furnish nutrition, and not in a state that will lead to decomposition. When we consider the possibilities of our work in connection with Bright's disease, diabetes, and various gouty conditions, we realize the importance of our sphere.

I am sorry certain men are not present today, because I wanted to talk more personally and pointedly than it would be fair to talk in their absence, and consequently in their inability to make reply. There is one feature of our ethical obligations that is neglected frequently by prominent members of our profession. Just so long as the men whom we place in exalted official positions—men to whom we do honor—become officers in the various gold-brick concerns with which we are afflicted, concerns which are simply adopting this course to work off on us shares of stock in some concern that is going to supply us with our own materials, or worse still, is going to supply our patients with certain materials, and only want to enlist our aid in doing so; just so long as we allow men whom we place in these conditions to do this, just so long shall we be the butt of the other professions.

The question of the colleges has been taken up thoroughly. The colleges we are "gunning for" are the colleges conducted for revenue only. There seems to me but one hope for our colleges, and that is in the development of the university spirit. By this I mean that spirit which makes every man on the faculty of a college or the board of instruction give his time and energy to this work, at a return which he could easily double if he stayed in his own office, which means the making of sacrifices in order to educate the men who are coming into the profession.

I do not like the term "specialty in medicine." One reason why I dislike it is that I have been brought into contact with these men to a considerable extent, and as a rule, when I see a man who has both degrees, he is ashamed of his dental degree. He is practicing a specialty of medicine, and does not want to be known as a dentist. Now, gentlemen, I am proud to be a dentist, and I am ready to stay a dentist as long as I live, and I want to work to make the profession one that we will all be proud to be members of. We have work to do along the lines we have had pointed out to us today by Dr. Nyman.

Dr. NYMAN (closing the discussion). It is evident from the discussion that at times in the presentation of my paper I read so rapidly as to be misunderstood. I did not say as Dr. Barrett thought I did, that dentistry was so essentially a specialty of medicine that the schools of dentistry and the state dental boards were somewhat in danger of absorption by the medical profession. What I said was diametrically different; for I said that such apprehension was misapprehension, and that even if dentistry came to be commonly regarded and classed as a specialty of medicine, still there would be the necessity for dental colleges and boards of dental examiners, and still would they continue to exist.

Nor it seems did I make myself clear to Dr. Gillett, for he quoted me as saying "We shall receive the recognition we demand," etc.; whereas the paper reads "We shall receive the recognition we command rather than what we demand." I was very much interested in his statement concerning the value of the charitable work of the medical profession. I have always felt that it far exceeded that of all the other professions, and put the seal of high nobility upon the profession.

I know of two men of our profession in the city of New York—one of them I see before me now, but I shall not mention his name because I believe he would rather I did not proclaim his philanthropy—who equipped a room in one of the New York medical infirmaries, and who devote a certain number of hours each week to charitable dental services. It would be well if more of us did likewise.

It is to be deplored, as Dr. Gillett has said, that men of standing in our profession will lend the aid of their names in the commercial exploitation of our profession, for the sake of a few dollars' revenue from a limited amount of stock. It is an exhibition of the mercenary commercial spirit instead of the professional spirit.

I do not condemn all stock colleges, but I say they should be abolished, because of the opportunities they present of imposing both upon public and profession from motives of pecuniary gain. I grant that in the past they may have been the only means of instituting our professional schools, but at the same time I contend that conditions have so changed that they are no longer a necessity, but are something of a menace. I quite agree with Dr. McManus that many state-board examinations have been manifestly unjust and over-difficult, and at the same time have been of very little value in determining a candidate's fitness to practice dentistry in the commonwealth; but on the other hand it cannot be denied that many college courses are wofully lax and inefficient. I cannot agree with Dr. Tracy that a man's titles make any difference in the nature of the practice in which he is engaged; if a man with the title M.D. in the practice of dentistry is practicing a specialty of medicine, so, too, are all the other practitioners of dentistry, whether they hold the degree of M.D. or not. I know a man in the practice of dentistry who holds the title LL.D as well as D.D.S. and yet one could not logically contend that that man was practicing a specialty of law because of his title LL.D.

I think we are destined to see our operating rooms alter vastly in appearance from what they used to be; the necessity for sanitary equipment and environment is self-evident, and will soon be generally demanded by the public.

I trust no one is under the impression that I am in any way ashamed of our profession, for on the contrary I am proud of it. It is fully as honorable as beneficent; as scientific as any of the professions; but I do not think we have reached the status we should occupy. I am deeply appreciative of the kindly personal remarks of the gentlemen who have taken part in the discussion. They are among those who make our profession one worth while in which to labor.

I feel that I have been honored by the invitation to appear before this society, and for the many hospitalities and courtesies that I have been the recipient of; I thank you.

(To be continued.)

PENNSYLVANIA STATE DENTAL SOCIETY.

Thirty-eighth Annual Meeting.

(Continued from page 1156.)

Dr. Burkhart's paper was passed, and the next order of business as announced by the President was the reading of a "Eulogy of Dr. C. S. Beck," by Dr. H. Newton Young, Wilkes-Barre.

After the adoption of *In memoriam* resolutions, the motion was made and carried to adjourn until Wednesday morning at 9 o'clock.

Wednesday—*Morning Session.*

The meeting was called to order by the president, Dr. Arthur, at 10 o'clock a.m. Wednesday morning.

The first order of business was the reading of the minutes of the previous session by the secretary, Dr. Weaver.

The minutes were approved as read.

The next order of business was the reading of a paper by Dr. L. Ashley Faught, Philadelphia, on "Metabolism as a Connecting Link Between Dental Surgery and General Medicine."

[This paper was printed in full at page 1093 of the November issue of the Cosmos.]

Discussion.

Dr. B. Holly Smith, Baltimore, Md. I want, before beginning this discussion, in order to put myself right with the audience, to say that Dr. Faught is one of my good friends, and I would not dare to take the liberty which I propose to take with his paper but for that fact. I hope you will understand that when the discussion is closed Dr. Faught and myself will perhaps meet and shake hands.

The first time I read this paper I read it casually, and laid it aside thinking there was much to confuse, little to instruct, and its most important conclusions diametrically opposed my views. I read the paper again, and decided that I was too hasty in my first conclusion, and since I have heard Dr. Faught's clear delivery of it, I am more pleased with it than before. I am pleased with it, because it shows the disposition to uplift our profession, even though it proposes to do so by a method to which I have always been opposed. The essayist makes the announcement that the literature of the day indicates the status of the calling which produces that literature, and contends that if we had more men who were willing to spend their time with the long list of, to me, strange authors—Brubaker, Hare, Pavy, Hofmeister, Hewlett, Porter, and other scientists—it would tend to a general uplift of dentistry. Now, gentlemen, in spite of this delightful excursion into the unknown—and I might say almost unknowable—I want to contend, even though I am diametrically opposing the essayist, that the mechanical training, the technical training of dentistry, has done more to make it a respected and honored profession than all the excursions into the doubtful realm of medicine. We are respected by the medical profession not because we can discuss with them the more abstruse questions of medical science, but because we can do with an exquisite technique the surgical work of our own special field—the mouth. And I say to Dr. Faught that he would take dentistry, American dentistry, and make it European dentistry; he would rob it of the technique, of the skill which has made American dentistry famous the world over, and put it on a plane with the dentistry that comes from European universities. There, men go into classes shoulder to shoulder with medical men, but whatever the extent of their attainments, it is a matter of common knowledge that in technique they rank far below the average American dentist.

You know there is a necessity for special teaching in dental anatomy, dental physiology, and dental chemistry, and the teacher should make the selection, not the student. Everyone knows there is an advantage in wide reading and in broad study, but essentials must not be lost sight of. The teacher should give the proper emphasis to the important features of these various sciences as related to dentistry. But where the poor dental student is taught along with the medical classes, he is handicapped from the start, because his examiner will say, "Oh, well! he belongs to the dental class, and it makes no difference about his examinations, as these studies are of little use to him." He has scattered over a large field time and attention that should have been concentrated on his own special work. In these days of fierce competition, closer specialism is needed, and not reversion to the general training of the older times. It is important that the dental student train his hands and his eyes, and become familiar with the materials that the dentist uses in order that he may be capable of doing the best that can be done in his profession.

Dr. JAMES TRUMAN, Philadelphia. I do not agree with my friend Dr. Smith. While I agree with him in some respects, I hold with the essayist that the subject of the complex relations of the human organism is one of the utmost importance to the average dentist, and is one that in my opinion he most neglects. I am fully in agreement with Dr. Smith that the practical side of dentistry is of vital importance, so much so that I believe that if it were stricken out of the world's work today, if such were possible, it would be one of the greatest losses that the world has experienced in a century; but because I am of that opinion it does not necessarily follow that we must neglect these important subjects that lead up to a knowledge of the human organism and the metabolic changes that are constantly going on in the system. I admit that this is one of the most difficult problems with which we have to deal, and I agree with Dr. Smith that probably comparatively few medical men are equal to asserting positively that they know all about it. It involves the study of too many different subjects, physiology, pathology, chemistry, bacteriology, and all the foundation subjects that are taught at the present time, and that are of so much importance to the average dentist as well as to the medical man. When you take into consideration the fact that all—I may say all—that can be claimed as science in medicine has been accumulated in the last thirty to forty years, then is it not true that the men who graduated in medicine prior to that period, or even at a later time, cannot possibly be very much in advance of those who have been trained in our profession?

I do not believe that the medical man of today—and I speak with due reverence to that profession—are practically any better or more able to serve common humanity than the average dentist, that is the dentist who understands his profession. I do not mean by this the dentist that is skilful in filling teeth, or making a set of teeth, or is familiar with those details that are so necessary, but the one who knows that when he places a filling in the mouth, it is his duty to comprehend the effect of that filling on the general system, the effects on the metabolic processes that necessarily follow. Especially is this true of the man who places a whole denture in the mouth. He must know, if he knows anything, the result of that perfect mastication on the general economy; he must know if he places a fixture in the mouth for a certain purpose, that it must be done in such a way that no untoward results will follow. Again, if he is treating various conditions that come into his hands, does he give due consideration to the agent that will accomplish the best results? Does he take into consideration the full effect of those agents we so frequently use, astringents, antiseptics, analgesics, and anesthetics? Is the full effect of these agents upon the general system comprehended? If not, then he is not educated up to the proper point in dentistry.

I do not think that eventually dentistry will be incorporated or merged into medicine. While it is really a specialty of medicine, dentistry again will be subdivided into specialties. I disagree with the essayist when he asserts that this is not proper. I hold that it is essential to progress that we should divide into special branches; that the orthodontist should do his work; the bridge-builder his work; the prosthetic dentist his work; the operative dentist his work, and let us all do that for which we are best adapted in order that we may perfect the whole. Dentistry is growing more and more complex, and it is impossible for any one man to carry along every line. I have spent as much time in the study of dentistry, I think, as any man here, and I feel today that I know but little about it. When I approach some men and see the skill exhibited in certain lines of work, I feel that I shall go out of the world conscious that I have not accomplished all of dentistry that it is necessary one should know.

Dr. FAUGHT (closing the discussion). There is very little I wish to add to the paper, as there is very little that I can add, but I feel constrained to give a few of my reasons for presenting it. I became so impressed, in my studies, with the very great necessity for our looking into the nutritional changes, that I began to read very faithfully last winter many works to get information and matter on the subject. I became so impressed with the importance of this subject that I determined to write a paper on it. I then turned to dental literature, and was astonished to find that it contained but little. There are men who have been thinking and writing on this subject, but for some reason they have shot over the heads of their audiences, assuming that the basic principles, the schoolboy material which I put in the paper, was understood by their audiences. When we wish information on this subject we have to go to medical literature, and one of my objects was to reduce a great deal of this material into the condition of a paper, so that it would go into dental literature. Secondly, I became impressed that it was not sufficient that we take in enough material to build up tissue; that the first mission of the system is to keep the cell active and vital, to keep energy in the cells, and if it cannot get the materials to supply this cell-energy, it is going to take it from the tissue-building material. So the idea that when a person is growing thin and losing weight we must put in more tissue-building material, is erroneous; we want to put in enough fats to supply this energy, providing it along lines which will produce this energy in the tissue. When you supply these cells with material to supply the energy, you will have a building of the tissue, and when they lack this fat the products will be stolen from the tissue-building material for that purpose.

Now, the delight of every essayist is to present a subject in such a way that it will have the same effect as that of waving a red rag before a bull to make him charge. I am glad to bring out my friend Dr. Smith to the point where he has given us this interesting presentation of the subject. I knew if I could induce him to say something it would be interesting, and he has given us a beautiful presentation.

The paper was passed and the special order of business as announced in the program, the election of officers, was taken up.

Dr. DePuy called attention to the fact that considerable criticism of the members of the Examining Board had been made for prosecuting the violators of the law regarding applications for license during the recent examination held in Pittsburg. As one of the members active in prosecuting these violators, he felt that the Council should have been courteous enough to present his name for nomination to the board for another term, and felt that this action on their part was due to the criticism of the part he had taken in this matter. He then asked for the sense of the society with regard to the further prosecution of the violators of the law, and asked if the society upheld him in his actions.

After considerable discussion, Dr. LIPPINCOTT presented the following motion:

> That the Pennsylvania State Dental Society heartily indorses the action of the State Board in prosecuting the recent violators of the law.

The motion was carried.

Dr. Lippincott moved that the first order of business for the afternoon session be the report of the Committee on the President's Address.

The motion was carried.

Motion was then made and carried to adjourn until 2 P.M.

WEDNESDAY—*Afternoon Session.*

The meeting was called to order Wednesday afternoon, June 27th, at 2.30 o'clock by the President.

The society listened to the reading of a paper by Dr. D. O. M. LE CRON, St. Louis, Mo., on "Crown and Bridge Work."

[This paper is printed in full at page 921 of the September issue of the COSMOS.]

Discussion.

Dr. P. B. MCCULLOUGH, Philadelphia. Time does not permit elaborating on such of the essayist's remarks and work as I admire. Three propositions in the paper, however, admit of an adverse opinion.

With regard to the half-collar crown, I made a statement in a paper recently to the effect that the half-collar crown as an element of humor was unique. As I understand it, the object of the half-collar is to provide enough strength and to conceal the gold. The first is a myth; the second is valid upon the assumption that the full band shows, which is not necessarily the case. The half-collar does not resist stress from the direction in which force is applied, for the following reason: The direction of the application of force upon an upper incisor is upward and outward; the point of stress is on the pin at the opening of the canal. The crown with the pin represents a lever; the pin in the root the weight arm, and the labial edge of the canal the fulcrum. Force applied to the incisal edge of the crown (weight arm) presses the crown up and out, resistance at the labial edge of the canal (fulcrum) causes the pin to bend, which moves the band palatally away from the root, then down and out.

With regard to burnishing: By virtue of the property of malleable metals they should be adapted, not burnished. Burnishing is the condensation of the surface molecules. Condensation of the surface, with the molecules in the body of the metal in repose, causes a warping toward the surface burnished; therefore metals are best adapted with materials softer than steel.

I have never made an all-porcelain crown, for the reason that the kind of joint made between the facing and the cap is not the kind I like to see; and further, because if an incisor be made strong enough, the palatal surface is clumsy; if contoured, it is weak. The idea of its translucency is exaggerated, because it is divided by the opaque dowel and facing pins. The statement often made that the physical properties of porcelain are more like tooth-structure than any other filling material we have, I think is an "optical illusion." When I first heard that steel with a hardened surface and a soft core was more resistant than when uniformly hard throughout, I believed it, because my teeth are made that way—enamel, dentin, and cementum. Enamel has practically no yield, while dentin is elastic. We see cracks in the enamel radiating in every direction with the dentin intact. Porcelain is homogeneous and brittle; it is in a less degree abraded than natural teeth, and is not eroded. Teeth yield to both erosion and abrasion. Gold is malleable and abradable.

I like the conservatism of the gold inlay as a means of anchorage. I cannot, however, imagine their holding when both are soldered to the bridge. This means that the anchorage of the inlays must not only be strong enough to hold the bridge, but in addition must be strong enough to hold the abutments independently immovable. This, I think, is impracticable, and for this reason I use them with a movable joint only.

Dr. W. A. CAPON, Philadelphia. I have only found delight, and have nothing to criticize in the paper just read. Dr. Le Cron has made such a reputation for himself that whatever he says one can take for granted as being pretty nearly correct. I think the good book says that "By their works ye shall know them." The simple fact of passing such specimens as the essayist has passed will show you what he can do by his method.

I think I understood my predecessor to say that he had never made an all-porcelain crown. I have been making them for sixteen years, and I can prove that it is the best crown in the world. In regard to his method of making porcelain crowns, I have nothing to criticize except to say that I do not go to so much trouble, believing from my practice and experience that I can save much time and gain equal results.

In regard to making bands, I feel the same as does Dr. Le Cron, viz, that we have been making them too wide, and I keep making them narrower constantly. I do not care how wide you make them on the palatal or lingual side, because there they give great assistance in the resistance of strain; but when it comes to the labial side, they are of no assistance in this respect. In applying the tooth to the band, it is not necessary to accurately grind the surface of the tooth next to the platinum base, as that can be done very indifferently. All you require is that the facing should extend to the band, and then the porcelain will do the rest. In fact, in doing this work I prefer to have a gap there, because then the porcelain will go through to the point where I want it to go, thus covering the band in front, so that there is no possibility of the blue line which the doctor speaks of as occurring in the course of a year or two after the crown is inserted.

I agree with the essayist in his deductions in regard to the fusing of the porcelain, that is that the first baking should not be carried beyond the roughened stage. That is the strength-stage of the porcelain, but for the last fusing to give it a finish we must bring it to a perfect glaze.

In coming to bridge work, I am often amused by dealers selling furnaces with the recommendation that they are sufficiently large to enable one to make a three- or four-tooth bridge, as if every man doing porcelain work is going to make bridges. Let me tell you that as soon as you enter the field of porcelain bridge work, you are up against the hardest part of dentistry, and I do not think I can be criticized in making that remark even by those who have extended experience. I know whereof I speak, as I have been "through the mill" and know all the different phases of this work. It requires the greatest care, most perfect adaptation, and a great deal of experience. You can do small pieces of course at first, and probably do them very well, but when it comes to the large pieces, it takes a great deal of experience to produce satisfactory results. One thing you must remember, that was not spoken of in the paper, is that in proportion as you have volume in porcelain, so do you have strength, and just in proportion as you decrease the volume, you decrease the strength. In doing this work, if you use abutments which the essayist and I have been using for years, you will probably arrive at something more satisfactory. However, that is a matter for another time. I am pleased to hear these ideas, particularly on the gold inlay abutments for small bridges.

Dr. JAMES TRUMAN, Philadelphia. I would be pleased to say just a word on this subject. I am not a skilful bridge worker, and therefore cannot discuss the subject from that standpoint; but I do desire to extend the discussion of this morning in regard to operations resulting in pathological conditions. When banding crowns was first introduced, I took the position that sooner or later the dental profession would find to its sorrow that they were performing an operation that would work to the injury of the patient. I have never seen any reason to change that view, in fact I have seen so much to the contrary that I am more and more convinced that whether half-bands or whole bands are put upon the roots of the teeth, the resulting pathological conditions are of a most serious character. You all know very well that when you band a tooth you are pressing against one of the vital parts of that tooth—the peridental membrane. Constant irritation there is the result, and in a majority of the cases, from my observation, the pericementum becomes diseased and finally destroyed.

Now, before we undertake to discuss whether a band should be a half-band or a whole band, with the intelligence that our friend spoke of in his paper this morning, let us first consider whether we should use a band at all; whether, when we are dealing with tissues easily disturbed by a foreign body, we are not pretty certain of producing bad results. I speak with some degree of interest in this matter, for I am personally a sufferer; I have lost several teeth in my own mouth by that very process, and I have seen the same result in a great many others. There must be proper consideration given to the pathological conditions that are likely to supervene by such operations. I do not pretend to condemn bands altogether, but I do contend that a large proportion of those that are being used are being used without any definite care, or knowledge of the pathological condition that may supervene.

Dr. McCullough. I would like to say a word regarding the remarks of the last speaker relative to the band. All the evidence that has been given in condemnation of the band is true so far as it is applied to the method of its application, but fault with the principle—and here the error lies—is invariably implied. The band is absolutely necessary and right; it is rarely properly applied; hence the pathological consequences.

Dr. Le Cron (closing the discussion). I do not think that I will add anything more to the paper, as I am on the sick list today, but will only thank the gentlemen for their kind words, and the association for the kind reception they have given me, and say that I appreciate the honor of being with you today.

The next order of business, as announced by the President, was "A Practical Talk on Orthodontia," by Dr. V. H. Jackson, New York, N. Y., illustrated by charts and many models and appliances. The following is a synopsis of the lecture:

A Practical Talk on Orthodontia.

Dr. Jackson opened the talk by describing how he regulated teeth in 1880, drawing teeth outward by ligatures to a labio-buccal bar; also describing how he regulated teeth by the use of collars, jack-screws, split plates after the Coffin method, etc.

He asked dentists who had been in practice twenty-five years or more what methods they employed for regulating teeth at that time.

He described the "crib" appliances which he introduced and used for several years, but not being satisfied with the anchorage of the crib appliances, he devised his present improved system of removable appliances.

The appliance consists of partial clasps, spring clasps, base-wire, finger springs, lugs, etc., assembled on an accurate plaster model, on which they are soldered. Spring-clasp attachments retain the appliances in position by grasping the anchorage teeth. They are made by first arranging partial clasps on the lingual sides of the molars and bicuspids that are to be used for anchorage. The partial clasps are made of pieces of 18-k. gold plate, No. 36 standard wire gage, contoured to fit the side of the tooth, usually the lingual side. The gold is roughened on the side on which the solder is to be applied.

The spring clasps are of No. 21 or 20 wire, either of gold, silver-nickel, platinoid, or German silver. They are shaped to fit the opposite side of the tooth from the partial clasps near the gum, with the ends passing over the arch, following closely at the junction of the teeth, and resting on the partial clasps to which they are finally soldered. A large wire known as the base-wire or body of the appliance is shaped to cross the arch, following the palatal curve, with the ends bent forward or backward at nearly a right angle, forming arms, which rest on the partial clasps, to which they are finally soldered, with the spring clasps. To this anchorage portion of the appliance springs of any form are soldered. They are shaped to extend like fingers for moving any of the teeth in the arch as desired. The base-wire crossing the palatal arch is termed a palatal base-wire; when it follows the lingual curve of the teeth, a lingual base-wire; and a labio-buccal base-wire when it is arranged to pass on the labial and buccal sides of the teeth. Each form of base-wire has its special advantages.

Expansion of the arch is required in a large majority of cases. When the anterior part of the upper arch needs lateral expansion, a palatal base-wire is arranged to cross the distal part of the arch where it is broad enough, with the ends bent forward, forming arms. The arms are soldered to the partial clasps with the ends of the spring clasps forming the anchorage part of the appliance. The solder is usually of chemically pure tin flowed with the soldering iron.

The appliance is fitted and worn about three days before force is applied, then before putting on force by bending, the appliance is laid on a thick piece of paper, a tracing made of it with a sharp pencil, and the tracing kept as a permanent record. A dot mark is made about one-sixteenth of an inch outside of the tracing to indicate the distance the arms or anchorage portion of the appliance is to be bent outward. The bending is done to correspond with the new marking by taking one of the arms of the appliance in the thumb and finger of each hand and pulling outward sufficiently to bend the base-wire a little, causing the appliance to conform to the new marking on the chart. This reduces orthodontia to a true science, as the distance it is desired to move the teeth by each application of force is determined and known beforehand, and a record of the change, with the date, noted by the chart.

Additional force is applied about once a week, each change being indicated by an additional dot mark on the original chart.

Discussion.

Dr. S. Merrill Weeks, Philadelphia. The fact that Dr. Jackson's talk has been simply a description of the making and use of his special kind of appliances, limits, from my point of view, the possibilities of discussion. Therefore I shall ask your indulgence for only a few moments. There are only two questions which I care to take up in discussion at this time: First, the character of the two kinds of force used in tooth-movement; on the one hand that expressed by the appliance indicated by Dr. Jackson, which consists of a force exerted by the spring appliance, and on the other hand the force obtained by the nut and screw. In reference to the spring force of Dr. Jackson's appliance, it seems to me that we are liable to cause a great deal more discomfort to the patient, particularly when occlusion plays an important part in the original position of the teeth, because the force exerted is continuous, and opposes the force of occlusion. On the other hand, with the force exerted by the nut and screw, we have, it seems to me, the conditions much more perfectly under control. That is, we can exert such an amount of force as would be indicated, and then allow the tissues rest so that they may accommodate themselves to the changed conditions.

Again, as to the facility of the two kinds of appliances, it becomes necessary to go into a discussion of, on the one hand, the removable appliance, and on the other hand the fixed appliance. With the construction of Dr. Jackson's appliances, and with their manipulation, we must admit that he has an opportunity for an excellent amount of cleanliness; but that seems to me to be more than balanced by the greater efficiency of the fixed appliance. It has not been my experience, as Dr. Jackson expressed it, that the placing of the wire ligature has the same deleterious effects as he has indicated. Neither has it been my experience that the gum tissues were injured—if the appliance be properly manipulated—enough to make it a consideration of vital importance.

It seems to me that the control of the patient plays a very important part in deciding as to the use of the fixed or removable appliances. It may be that Dr. Jackson is able always to have his patients wear the appliances as he directs, but on the other hand it is often true that they will not do this. My experience leads me to feel a sense of doubt with other patients than Dr. Jackson's. It is very easy for a patient to take the appliance out of the mouth, and keep it out until he returns to the office, and then come in with it in his mouth, by which act we have lost the entire action of the appliance for the time being. That is not possible with the fixed appliance.

These two thoughts, the compatibility of the two kinds of force used, and the lack of facility of the removable appliance, are all I wish to call to your attention.

Dr. G. L. S. **Jameson**, Philadelphia. I do not intend to enter into the scientific consideration of this question, but I wish to say that both Dr. Weeks and Dr. Jackson have done very successful work for patients of mine. One particularly difficult case I referred to Dr. Jackson, in which the results obtained were most excellent, and the patient came and thanked me for referring her to such a scientific and skilful man. Dr. Weeks has done a great deal of regulating for many of my patients, and he also has obtained most satisfactory results.

I would like to hear something about the necessity of extracting teeth for the correction of irregularities. Both the Angle method and Dr. Jackson's are efficient, and it is simply a question of the man behind the gun—the man who applies the method. I think both methods are good and produce good results, and as Dr. Weeks says, the question to be decided is whether the fixed appliance is more efficient than the removable. The feature of Dr. Jackson's removable appliances, by which a greater cleanliness can be had at all times, is of course an important factor. I am familiar with the work of both gentlemen, and they both obtain satisfactory results.

I understand that Dr. Jackson occasionally extracts certain teeth, while there are others who claim it is never necessary. I have seen very excellent results where the bicuspids and other teeth have been removed, and where the occlusion has been what most people would consider nearly perfect.

Dr. **Jackson** (closing the discussion). I am very glad that the subject has been so well discussed. I did not intend to speak today of extraction of the teeth in the correction of irregularities. A great deal that I have said in this connection has been misinterpreted. I do not under any circumstances recommend the extraction of a tooth, unless from a careful study of the case I think it is for the best interests of the patient. Altogether too many teeth are extracted.

I maintain, and a considerable number agree with me, that there are occasionally cases where extraction is required to bring about the best final result. In the treatment of some cases of extreme double protrusion of the teeth and jaws, where it is hereditary, and where there is what some would call normal occlusion, the operator is at fault if he does not extract. Do not misunderstand me to say that we should extract in all cases of double protrusion, as but few cases require it.

The dictionary meaning of prognathism is protrusion of both the upper and lower jaws, but when orthodontists speak of prognathism they mean prominence of the lower jaw, therefore I term prominence of the upper and lower jaws double protrusion.

If a patient presents with extreme double protrusion, as I had recently in a case recommended to me, and he wants to have it corrected, what are you going to do? Some would say, Do not extract, as the conditions were natural. But the patient demands that something shall be done to improve the facial line and the general contour of the features. When these prominences cannot be reduced satisfactorily by expanding the arches laterally and forcing all the teeth backward, extraction can sometimes be resorted to to advantage. (See my "Orthodontia," page 398.) Our duty as orthodontists is not only to bring about typical occlusion of the teeth, but to improve the facial contour. We should not work to make the patient look like the parent, if the features of the parent are too prominent and not pleasing.

Patients go to the surgeon to have him change the shape of the nose, the ears, etc. It is the parents' desire that the child shall not look like them, if the nose or other features are too prominent, and can be improved.

If either the young or the elderly lady have incisors or other teeth that have been pushed out of position by the influence of heredity or from pyorrhea alveolaris, we as orthodontists should correct those conditions, and we can generally do as well for the elderly lady as for the younger one; and, gentlemen, I bring you a new method of making appliances for doing this. The appliances are as suitable for regulating the teeth of the child, using the deciduous teeth as anchorage in either the upper or lower arch, as for the adult.

As to the question of retaining teeth after regulation, the same appliance used for their movement is generally continued in use as a retainer. It is removable, permitting thorough cleansing of the teeth and appliance. It is inconspicuous, and it does not permit the teeth to change as is common when a new appliance is inserted. After the teeth have become firm in their sockets, it is sometimes advisable to continue wearing the retaining appliance at night, leaving it off during the day.

Dr. Weeks has brought up the question of the two kinds of force. I felt that I had threshed that matter out some years ago. Those who have read back literature on the subject of orthodontia will recall that some years ago Dr. Farrar gave his preference to the screw for regulating purposes. Its application he termed the positive system, and enlarged on intermittent force as analogous to the law of labor and rest. In considering this view from a physiological standpoint, in discussion I made this statement (COSMOS, vol. xxix, 1887, p. 385): "The law of nature is that pressure and relief alternated cause hypertrophy, increased growth, hardening, and constant pressure causes atrophy or absorption. If you want absorption you must keep up a constant pressure without intermission or rest. We do want absorption in cases of regulating."

The tissues involved in regulating are tolerant of any kind of direct moderate force, whether constant or intermittent, excepting a force that is vacillating; that is, not having a definite fixed point of resistance and action—as is common in insecurely anchored regulating appliances, wedging the teeth with rubber, etc., which produce an objectionable inflammation. The force for moving the teeth should be applied in such a manner that the device will not impinge too heavily on the soft tissues. In my experience the force of a spring generated with slight variations is more effective, more agreeable to the patient, and requires less attention than other means.

In the matter of fixed and removable appliances, for some time I used the fixed appliances. I have many models where the impression was taken with the appliance in position, and then the impression after the case was finished in order to show the results. I have used the expansion bar with ligatures, and all other methods that have been presented, so far as I know. I used ligatures a considerable number of years ago. Finally, realizing how we were imposing on nature, I was led to devise a humane method. I would suggest that if anyone does not care to call my system the "Jackson" system, he call it the "humane" system, as when the apparatus is properly made, and the force applied scientifically and successfully by the use of a tracing or chart, as I have previously described, no pain or special discomfort should be experienced by the patient.

The subject was passed.

The Executive Committee, through its chairman, Dr. McFadden, announced that Dr. Broomell's paper would be read at the evening session, after the demonstration by Dr. Schamberg.

Motion was then made and carried to adjourn until the evening session, 8 P.M.

WEDNESDAY—*Evening Session.*

The first order of business was "An X-Ray Demonstration," by Dr. M. I. SCHAMBERG, Philadelphia, who spoke as follows:

X-RAY DEMONSTRATION.

There is no specialty in which the X ray has such a wide field of usefulness as in dentistry, and it is my belief that not many years will pass before nearly every case that comes to the dentist for root-canal treatment will at some stage of the procedure require an X-ray picture in order to definitely determine whether or not the work in that canal is perfect. So much has been written about the value of the X ray as a diagnostic aid both in dentistry and medicine that it is scarcely necessary for me at this time to indicate the various phases of dental work in which it is helpful. I believe the most pleasant part of my work during the past five years has been in connection with the X ray as an accurate means of diagnosis. Many cases of facial neuralgia which have in the past met an untimely death from the failure to locate the cause of this horrible affliction might have been detected had the patient had recourse to the X ray. We are only beginning to realize the many uses which it can be put to in the dental office, and in the city of New York at the present time a very large number of the general practitioners are installing, or have installed, X-ray outfits in their offices.

It is true that failures in radiography are frequent with the beginner, but it is something very much like ordinary photography; with a little attention to the details, perfect work can be accomplished by almost anyone with the proper instruction in a very short time. The great barrier against this work for a long time was the expensiveness of the outfits that were being built, which made it almost impossible for the general practitioner of dentistry to think of placing one in his office, and for a long time I hesitated to recommend the general practitioner to do so. I believe, however, that it has now reached that degree of certainty, that degree of satisfaction in all its workings, that I can conscientiously say that many of you will find it an intense pleasure, far more pleasurable than ordinary photography, far more helpful than any appliance that you can add to your armamentarium. I feel very strongly in this matter, for the reason that there has been for the past few years a prejudice against the X ray, which has largely been excited by newspapers which are looking for sensationalism and which have taken every opportunity to report and enlarge upon isolated cases of burns which have taken place in the past. I may candidly state that with the methods now employed in taking X-ray pictures burns are not only unlikely to occur, but they are unjustifiable. There is no necessity for such lengthy exposures as would create even an erythema or redness of the skin. In general surgery, where the X ray is used to locate a stone in the bladder or a stone in the kidney, the exposures are frequently somewhat lengthy, and if his appliance be not a modern and ideal one, by the exposure of the patient for such a length of time there is some possibility of creating a slight erythema. But I believe the only burns that have ever amounted to anything in the use of the X rays were those which occurred when X-ray work was in its infancy, and when the operator—through his inexperience and through his lack of knowledge of the action of the rays—permitted the patients and himself to be unduly exposed to this wonderful agent. There is no doubt in the mind of any man who works with the X ray that it has a decided therapeutic effect, and we are gradually coming to some definite understanding as to the character of cases which are benefited by this agent, and which it is possible to treat. It is by no means a panacea for all the ailments of mankind, but there are many conditions, heretofore refractory to any treatment, which are favorably influenced by this wonderful light.

It will be my pleasure this evening to demonstrate the technique of dental radiography, the method by which the X-ray picture is taken, and it will be my aim to develop these pictures later in the evening, and to be able to show the results tomorrow afternoon to those who may be particularly interested in this work.

Dr. Schamberg then described the apparatus, the different kinds of light, the different methods of using the X ray in the treatment of diseased conditions in the mouth, and also took several pictures of suspected diseased conditions.

The subject was then passed, and the President announced as the next order of business the reading of a paper by Dr. I. N. BROOMELL, Philadelphia, Pa., viz, "Is Oral Cleanliness the Chief Factor in the Prophylactic Treatment of Dental Caries?"

[This paper was printed in full at page 1100 of the November issue of the COSMOS.]

Discussion.

Dr. G. L. S. JAMESON, Philadelphia. Among other statements made in the paper is one in which the essayist says that decay is not more prevalent in unclean than in clean mouths, if the systemic conditions are the same. It seems to me that the great majority of practitioners who have been in practice for any number of years would take exception to this statement. When we want cleanliness, we do not mean merely the use of the tooth-brush; when we speak of cleanliness we must begin with the correction of irregularities of the teeth, and end in sterilization. Now, in order to have a clean mouth, normal occlusion must be brought about in the child. If the teeth are irregular, food products will collect, there will be gingivitis, and of course development of bacteria; acids will form, and we know that decay will follow. Therefore we have to see that the arrangement of the teeth is correct, so that they are in proper relation for mastication; that the proper diet is given, so that in mastication the foods will come in contact with the gums, and the latter be stimulated. Those of you who are horsemen know something of the effects of different foods in the mouths of horses. If your horse has lampas, you say to your coachman, "Give the horse corn," something that you know will stimulate the gums and overcome the conditions in the horse's mouth.

To continue on the line of cleanliness, how it is brought about, and how uncleanliness may be induced, we also have to do proper contour work in fillings, crown work, and bridge work. Then we have to see that the teeth are properly scaled, that they are properly silked, brushed, and sterilized by compressed air and antiseptic solutions. After everything comprehended in the broad interpretation of cleanliness has been done, I do not believe that there is a person present—except Dr. Broomell—who would not say that we would have a condition very much superior, although the systemic conditions may be the same.

In referring to the systemic conditions, I think that they have a great deal to do with the teeth, particularly up to a certain period in life; that is, until calcification takes place, and probably a little beyond that. I do not believe, however, that the systemic conditions have any particular effect directly on the hard tissues of the teeth—the enamel, cementum, and dentin. I do not believe that the teeth are affected materially by typhoid fever or any other disease of that character. Do not misunderstand me, though. If a person has typhoid fever, the secretions are different. Not only that, but the patient is unable to cleanse the teeth properly, and indirectly they are affected by the environment; but I do not believe that the hard tissues of the tooth are affected through the blood circulation. The doctor speaks of consumptives' teeth decaying. I think the experience of the majority of people with consumptives is that they have remarkably good teeth in cases where the teeth are properly cleansed; but where there is so much disease in the system and the secretions are affected the environments are bad, and of course, if the patient does not take care of the teeth, there will be more tendency to decay than if the person were in a healthy condition.

In speaking of the half-civilized people having good teeth, I think that is largely due to different foods. The foods that they eat are not conducive to developing the bacteria; and besides, they eat roots and herbs—coarse foods—and the effect is something like the horse eating corn; there will be a stimulating effect upon the tissues, consequently they will not have gingivitis from lack of stimulation. I think if these people had eaten fruit, ice-cream, candy, etc., their teeth would probably have been as bad as those of our civilized people.

Of course the doctor has taken what would seem a radical stand in this paper, and as there are others interested in this subject, I will not occupy your attention to any great extent. But in speaking of cleanliness it does not mean the simple use of the tooth-brush, it means our polishing and taking care of the teeth so that they will not become unclean; and if proper contour work were done by the majority of the profession, I think there would be a very much better condition in the same mouths under the same systemic conditions, than if our prophylaxis were not followed.

Dr. James Truman, Philadelphia. I thought, Mr. President, that I had possibly lived long enough to run no risk of being told that cleanliness was not next to godliness, as old Father Wesley taught us; that we can be as filthy as we please in regard to the mouth without any risk of decay. It must have required a great deal of courage on the part of the essayist to come before an association of dentists with these heterodox views. For if dentistry has done anything in the world since I have been connected with it, its teachings have been in the direction of absolute cleanliness, cleanliness not only of the mouth, but in every direction.

I think, however, there is a good deal of truth in what the essayist says; but like a good many other truths, there is something behind it that he has failed to give us. He does not present the conditions that are likely to cause caries. He simply enumerates certain individuals—careless persons—in whom decay has been noticed, and where it has ceased by changing the conditions. What may that mean? It means, if I understand it correctly, that the whole systemic disturbances were changed by the change in the environments. To my mind, it is impossible to hold to the idea that any individual can be as uncleanly as he wishes, and there be no injury to the tooth-structure. I do not, however, favor the idea of Williams that his plaques, indorsed by Black, are the cause of dental caries. But I do believe, and I think it is capable of demonstration, that if we have secretions, accumulations around the gingival borders of the teeth, we will have more or less acidity and more or less destruction. Therefore, being a chemical action, it will depend largely on the character of the foods deposited and upon the environments of that individual. The teeth may be as filthy as some we find in the slums—although perhaps as clean as the individual can make them—and yet the conditions and environments will change the whole character of the teeth. We all have noticed persons who while engaged in certain lines of work had teeth of comparatively good structure; but when they have become employed in confectioners' establishments, for instance, in a very short time the teeth begin to show evidence of decay, and eventually are destroyed. I had one family of confectioners in my hands at one period who all lost their teeth with great rapidity, and I have observed the same thing in other establishments. This result will occur wherever conditions invite chemical change, as in vinegar establishments, large chemical works, dye works, etc.

Dr. Broomell cites the examination of a series of skulls by different practitioners, but I do not regard this as positive proof. It is true that the aborigines of this country, or the aborigines of any country where they subsist largely upon meat diet, will not have much decay. It has been demonstrated by Miller in his experiments that meat does not produce decay; that artificial decay cannot be produced by meat alone; carbohydrates must be present in addition. Therefore if people lived upon meat diet in the days before civilization, decay to any extent will not be found, it is not found in the Eskimos. Mummery demonstrated in his examination of teeth of all nationalities that the Eskimos and the early British showed but about two per cent. of decay, proving or demonstrating the fact that it was largely due to the diet of the individual. Probably all have noticed the fact that in persons of foreign birth who have been raised on a simple diet, who come to this country and live upon the foods that we are using here, decay rapidly ensues. Therefore I do not think that his argument will hold good.

I think that the essayist does not state Dr. Black's idea as I understand it. Dr. Black's examination of teeth, according to his experiments, was to the effect that they were of an equal character, but he does say that as we go on in life these teeth become better, increasing in density. This is true from clinical observation. I am not here to contest the question of whether Dr. Black is right or wrong, but I do not believe from my observations on teeth histologically and clinically that thus far he is right. I told him, however, that I did not consider that his experiments demonstrated that all teeth were equally good. Dr. Broomell is absolutely correct when he says the tissues of the teeth are not alike. Therefore in some mouths, as in tuberculous patients, the teeth will decay with more rapidity. We all know that when patients are attacked by a continuous fever the destruction is rapid. This is not due to the fever, but to the unsanitary conditions long present in the mouth and uncared-for by nurses. I would not like to have it go out from this meeting that uncleanliness is to be taught in the dentistry of the future.

I want to say one word with regard to Dr. Smith's prophylaxis methods, which the essayist contends are of practically no value. Dr. Smith brought out more fully what was taught many of us fifty or sixty years ago. I remember that my old teacher, Dr. Townsend, gave his students lesson upon lesson on that subject, known then and for many years as "cleaning the teeth," but which is now called prophylaxis. I must say from an examination of many of Dr. Smith's patients that his thoroughness in the work, his practical application of certain methods with his patients, has prevented and will prevent disease of the oral tissues, if this care be continued. This may be regarded as simply a dogmatic assertion, but a careful examination of some twenty of Dr. Smith's patients, and an observation of the perfectly healthy tissues at the margins, convinced me of the truth that I have never seen such conditions in the mouths where there are secretions allowed to collect at the gingival border, conditions common to the poorer classes. I am convinced, therefore, that cleanliness properly conducted promotes health, and will prevent pathological results in the oral tissues.

Dr. OTTO E. INGLIS, Philadelphia. It seems worth while to consider more fully where we find dental caries. It occurs in particular places on the teeth, in the fissures in the occlusal surfaces where the patient cannot keep the teeth clean; on the approximal surfaces, and even upon the cervical margins, particularly in those cases where the gum forms an angle with the teeth, into which the brush does not ordinarily go. We also find it on surfaces which ought to be kept clean but which are not kept clean, such as the buccal surfaces of the molars. I think it is a common experience that when we observe the third molar, and particularly a third molar that turns out toward the cheek, there is noticed a vast difference between its buccal surface and that of the second molar. Generally the second molar is clear and polished and the third is of an opaque white color. The explanation of that is quite simple. The patient, in brushing, brushes back past the second molar, skipping the third. I frequently ask patients if they cleanse their teeth thoroughly, taking pains with the third molar, and then tell them how it should be done, and in many cases they say they have not cleansed their teeth in that way. Of course there are cases where the teeth do not decay, even with apparently great uncleanliness. Dr. Miller in a lecture delivered a few years ago pointed out the fact that where putrefaction occurs to any great extent an alkaline reaction is produced, and it is also probable that the chemical substances capable of fermenting with acid reaction are exhausted and remaining *in situ,* act as a protection to the tooth-surface, themselves incapable of forming acids. In Dr. Miller's experiments in the artificial production of caries with fermenting breadstuffs, it became necessary for him to renew the bread frequently, otherwise an alkaline reaction occurred. It was in the non-observance of this fact that Miles and Underwood failed to reproduce his experiments.

I do not know whether any of those present remember it or not, but in 1898 there was a paper published which I read before this society dealing with dental caries. I made some experiments, in which a few minutes after a meal the mouth was rinsed with sodium bicarbonate to the point where no acid was found with litmus paper, yet twenty minutes later I was able to find acid in different parts of the mouth, showing that fermentation occurred within twenty minutes. In another experiment I sterilized the mouth after a meal with potassium permanganate, and I found that no acid reaction occurred after a meal for many hours, showing that the bacteria had been removed, although fermentable food particles were left in the mouth.

Dr. Miller told us that such substances as meat and eggs do not ferment with acid reaction, but with an alkaline one. He showed also that carbohydrates which have not been cooked do not produce an acid reaction, but that cooked carbohydrates do produce one. Speaking of rapid decay, and directly in line with the point Dr. Truman made, I had a case of a child three and a half years of age, whose mouth I examined and found but two small cavities. I have never in my life seen more beautiful teeth. Up to that time the child had had no desire for candy, but later the father got into the habit of bringing candy home, and the child would frequently eat it, taking no particular care of her teeth. In eighteen months there were thirty or forty cavities in that mouth. It appeared as though the enamel had been removed by acid from over the dentin, leaving in many teeth a yellow somewhat softened dentin of about the form of the original. It was a case of decalcification, although of course there must have been some carious process.

In regard to the structure of the teeth, we hear statements about dentin being hard or soft, but I do not exactly see what the dentin has to do with decay of the teeth, at least not primarily. The enamel is the structure on the outside of the tooth, and we know there is a vast difference in the appearance of the enamel of different teeth, and in the way it responds to our cutting instruments. We see teeth that we think will probably decay because of the structure, as shown in their opacity and roughness. I think it is largely a question of the resistance upon the part of the tooth to chemical action—insolubility as opposed to solubility on the other hand. Usually we find that soluble teeth have a surface that is rough and uneven, thus offering opportunity for the lodgment of bacterial plaques or food.

There is no doubt that the systemic condition has a favoring or inhibiting effect upon the fermenting agents in the mouth; as for example, general hyperacidity or hypoacidity as shown by Michaels. Eventually, if we are ever able to say what the real relation of this systemic condition is to caries, it will in my belief show uncleanliness and resistance upon the part of the teeth to be practically the important factors in caries, which must of course be considered in prophylaxis.

Dr. H. C. REGISTER, Philadelphia. I unfortunately missed most of Dr. Broomell's paper, but I heard enough to learn that according to his remarks he did not believe in the cleansing of the teeth as we ordinarily apply the term. I want to put you on your guard that these are his views on paper only, because personally I know him to be a man extremely particularly about cleansing his own teeth. So when you take this, and apply it to yourself and to those in whom you are interested, let the paper, both precept and principle, be properly interpreted. Cleaning the teeth as generally understood is a misnomer as applied to prophylaxis. Prophylaxis does not mean cleaning the teeth as we understand it in an offhand way, viz, cleaning the surfaces thereof; the cleaning of the mouth is not cleaning up dirt only. If you could turn a microscope into the oral cavity and get a look at the teeth, you would find there a condition of biology that might change the whole tenor of your practice. Biology as it applies to the mouth presents a life that exists there in the form of numerous micro-organisms that must be accounted for, whether the practice be radical or conservative. It does not make any difference whether you call yourself a dentist, stomatologist, or any other -ologist, you have a physico-chemical condition to meet. In prophylactic work you are not interested in removing the dirt—you are removing and antagonizing growth, growth which is one of the most persistent conditions that we have to meet, a growth as persistent as the conditions of life can be made. It is this growth and what this growth represents that we as dentists or stomatologists must contend with if we are going to anticipate decay in its primary influences. There is no doubt in my mind at all in regard to what Dr. Broomell says in reference to systemic influences, which have an immense amount to do with the decay of the teeth; conditions of susceptibility which we know little about and cannot anticipate, yet we know they are there.

Referring to Dr. Black's experiments in his chemical analysis of tooth-structure, I think he may be right. I believe he is right, when he says that the *analysis* of the tooth is the same under all conditions throughout life; but we cannot accept the implication that all teeth are physically and chemically the same, because in analytically considering the tooth we do not take into account the point referring to the life-energy of the tooth. As I mentioned in a paper that I read some time ago, you can take the analysis of a muscle, and the product of that analysis will be precisely the same whether it be that of an athlete or be that of a weakling, weight for weight so far as the analysis of its chemistry goes, but we leave out the principle involved—the life-energy. As we have that condition the same in the teeth as anywhere else in the body, why throw it out entirely? That is one of the greatest mistakes made. Some teeth are better than others because of that life-energy, and that is what makes the great difference. We also find teeth undergoing physical changes. There are certain conditions in the teeth when the system is under certain influences that explain the changes in these organs. Now, we must consider these physical influences, the metabolic influences at work, because undoubtedly they affect the teeth just as they affect *per se* other tissues. Look at people who become sterile—old people. Why I have had them in my hands when the teeth would almost melt away. To say that that is absolutely due to external conditions, I do not believe; I believe it is due to external and internal influences combined.

In regard to the care of the teeth I think there is a great error on the part of profession and laymen, in that they are taking care of the teeth as though they were taking a bath. Now that is a mistake. As I said in the beginning, you have to realize what it is that you are antagonizing in the mouth. It is not dirt, but it is a growth, and that growth will be augmented by the food relations. It makes considerable difference whether or not you allow that food relation to remain there. In my own experience, I have instituted in my prophylactic work the use of atomization, and with germicides under heavy pressure. I have had cases where the teeth have been so susceptible to caries that it was with the greatest effort I could help the patient to retain these teeth; but by the system of sterilization, stimulation of the gum tissues, and stimulation of the teeth themselves, you help the whole physical being, because the dental tissues are a part, and draw their nutriment from the other parts of the body just the same as does any other organ. Now it is this pathology of dentistry that we want to get at, and notwithstanding what Dr. Broomell says, he cannot affect the fact that if the teeth are looked after hygienically, this care, and it alone, constitutes the forerunner in anticipation of caries and other pathological conditions with which the dentist has to contend.

Dr. S. B. LUCKIE, Chester. The essayist asked a question and then took the negative side, although he has not altogether neglected to discuss the other side. He cites the dental condition of some of the earlier races of men who did not have dental caries. He said that they did not perform the act of cleaning the teeth. Perhaps they did not, and while I am not familiar with the food habits of these races, I do believe and am impressed with the fact that they *did* use coarse foods, and therefore through the natural process their teeth were cleansed. The excursion of the coarse food over the surfaces of the teeth not only cleansed the surfaces, but also kept the gums and cheeks in a measure clean. It stimulated flow of the saliva, and probably they had normal saliva, or more nearly normal saliva than the average individual has today. That is one thing we must consider, I think, in this question of oral hygiene and prophylaxis. The question of oral prophylaxis I believe goes back to the time when man did not have caries. The history of the past must be followed up, and compared with the food habit of the individual. I believe the duty of the profession today is to overcome the effects of the present food habit, the cooking of the food, and the effect that it has in the oral cavity. I believe it is the province of the dental profession to devise some way by which the effects of the present food habit can be overcome in the oral cavity, and it appears to me that the only way we are to do this is to keep the surfaces of the teeth clean—just as Dr. Jameson spoke of the corn that was given to horses. I can remember when the horse was my companion, and when a young horse showed signs of lampus, we fed him on old corn and the disease disappeared. Why? The excursion of that coarse food over the gums had a tonic effect; the circulation was increased, and the disease removed. And that is the way in the human mouth. I believe that today if man lived on coarser food, or even masticated the food that he now eats, his teeth would be better and cleaner, and would probably require less use of the brush, pick, silk, etc.

Dr. BROOMELL (closing the discussion). I feel highly gratified indeed to know that all the speakers so fully agree with what I have said. I am particularly pleased when I find that my good friend Dr. Truman agrees with me, and the only parts to which exceptions have been taken are those to which I myself took exception. I would just like to read one or two clauses from the paper: "Nor will there be any attempt to take exception to the established facts regarding the etiology of caries, the present object being to consider the subject from the standpoint of the conditions which make caries possible." "Being fully convinced that cleanliness of the mouth is very much less important as a combating factor in the etiology of caries of the teeth than is generally supposed, and being equally confident that systemic conditions through their influences over the hard structures of the teeth are chiefly responsible for making caries possible, I shall proceed to point out why I believe this to be true. In attempting to do this the inference must not be drawn that uncleanness in the oral cavity is favored, because this is far from correct."

I make the statement again, because those who have discussed the paper appear to believe that the essayist has no thought regarding cleanliness of the mouth; that was not at all intended. I of course have a great deal of regard for this, knowing that it has its place, and for this reason I call attention to that one clause. I would also like to refer again to the title of the paper, because evidently the gentlemen who discussed the subject did not know the title: "Is Oral Cleanliness the *Chief* Factor in the Prophylactic Treatment of Dental Caries?" I contend that it is not the chief factor. It is a factor, but not the chief one. Dr. Jameson, who opened the discussion, has taken the subject up from the wrong end. He tells us that we must keep the teeth clean after they have begun to decay, and speaks of orthodontia; he also speaks of crown and bridge work and fillings—contour work. That is, he said we would have to start here in our work for prevention. That is not the time, but before that; we cannot afford to wait until we have lost some of the teeth and a great deal of their surfaces.

Dr. JAMESON. We have patients of different ages. Did I not start with the child, and lead up? I would like to ask one question. Did you not say that decay is no more prevalent in unclean mouths than in clean mouths, if the systemic conditions are the same? Did you not make that statement?

Dr. BROOMELL. I made the statement that decay was no more prevalent in unclean than in clean mouths if the tissues of the teeth be of the same resisting power, and I said that the resisting power of the teeth depended on the systemic condition, and that the prophylactic care of the teeth was a secondary consideration in that respect. Dr. Truman took exception to the essay because it cited one or two cases only. It is not possible in a short paper to describe a number of cases. I referred to a few cases which I happened to recall, thinking they would suffice.

Again, to return to the remarks of Dr. Jameson, he said he felt that such diseases as typhoid fever would not affect the teeth. Dr. Truman took exception to this, and I would like to add further that they do. We have these diseases affecting the epithelial structures; we can see it in the hair, the nails and in the teeth. I have had that experience myself. About two years ago I had typhoid fever, and after I recovered I found each one of my nails showed the effects of this illness. Of course in the teeth it would not have so marked an appearance, because the tissues of the tooth are not so readily reproduced as are those of the nails. Nevertheless, all epithelial structures are undoubtedly affected not only by this disease, but by all diseases of similar character, and they are also affected by systemic conditions in general; I believe these affect the teeth particularly.

Dr. Register remarks in his discussion that we do not understand these influences. I admit that there is something back of all this which we do not understand, but why should we not discuss it? I think for that very reason it is well for us to bring up matters that we do not understand. He acknowledges in the first part of his discussion that the teeth are a finished product, and afterward claims they are not finished, because they change with age and with conditions within the human being. Dr. Register also said that it is a question of stimulation. I think I attempted to bring this point out clearly when I referred to the treatment practiced by Dr. Smith. I said that I believed there was a great deal of good resulting from his procedures, although I did not believe it was from the fact that the teeth were kept clean by this means; but that teeth of poor quality might be made better by this treatment. I do not know that I can add anything else, than to thank you and the audience, Mr. President, for the kind attention.

Motion was then made and carried to adjourn until Thursday afternoon.

THURSDAY—*Afternoon Session.*

The society was called to order by the president, Dr. Arthur, at 3 o'clock Thursday afternoon, June 28th.

After the transaction of some routine business, the President introduced Dr. M. F. Finley, president of the National Dental Association, who addressed the society in the interest of the N. D. A. in regard to the approaching meeting of the latter at Atlanta, stating that through the efforts of the Southern Branch officers a very large representation from the South would be present, and advocated the attendance of a large delegation from Pennsylvania.

The President then appointed Drs. Head and Scholl as a committee to escort the president-elect to the chair.

Dr. ARTHUR, in presenting the gavel to Dr. Lippincott, said: I congratulate you on being elected to the position of president of this society, and trust that your work the coming year with the different committees will be as pleasant as mine has been.

Dr. LIPPINCOTT. I thank you sincerely for the kind words of congratulation, and I wish to say to the members of the Pennsylvania State Dental Society that I appreciate more than I can express the honor which you have conferred upon me in electing me as your presiding officer for the coming year. I trust that each and every one will do his or her part as much as in your power lies to assist the President and the Executive Committee during the coming year, that we may have a most successful meeting at our next annual assemblage.

In the report of the committee appointed to go over the President's address, it was recommended that a committee, of which Dr. Arthur should be chairman, should be appointed, to be composed of one member from each local society and one member from each county not represented by a local society. With the permission of the society, I will appoint that committee at a later date, in conjunction with Dr. Arthur.

The Committee on the President's Address also recommended the appointment of an historian to report at the fortieth anniversary of the society. To fill that office I will appoint Dr. Wm. H. Trueman. In consultation with Dr. Trueman he suggests the advisability of appointing two assistants. What is the wish of the society?

Dr. HEAD. I move that the president be empowered to add two members to the Historical Committee to assist Dr. Trueman.

The motion was carried.

Dr. H. N. YOUNG, Wilkes-Barre, then read the report of the Committee on Oral Hygiene and Public School Dental Service, as follows:

REPORT OF THE COMMITTEE ON ORAL HYGIENE AND PUBLIC SCHOOL DENTAL SERVICE.

While this committee, as a committee, have been somewhat inactive during the past year, it is largely due to the fact that concerted efforts at introducing the lecture system into the public schools for the purpose of intelligently instructing the children in the proper care of the oral cavity is usually met with antagonism by those who fear that lecturers may be endeavoring to further their own interests thereby. It therefore behooves the Pennsylvania State Dental Society to indorse and encourage the introduction of periodic lectures in the public schools by competent practitioners. The various committees on Oral Hygiene appointed by other state and national societies are more or less inactive, for similar reasons. While some little good is being accomplished by the meager examination of the mouth by the medical inspectors in Philadelphia, it is reasonable to suppose that so important a part of the human economy as the mouth, if it were thoroughly examined by several regularly appointed dental inspectors, would disclose conditions which might prevent the spreading of many of the grave contagious diseases which carry off to an untimely grave so many of our school children between the ages of five and twelve.

It is scarcely to be hoped that the work of your committee will be so far-reaching as to influence an early introduction into the public schools of a dental corps, but it is sincerely to be hoped that the not distant future will see this important work appreciated by the intelligent American public, not only in this state, but throughout the union.

H. N. YOUNG,
M. I. SCHAMBERG,
H. C. REGISTER,
H. R. SWING, *Committee.*

Dr. Kratzer moved that the report be received and filed.

The motion was carried.

There being no further business before the society, motion was made and carried that it adjourn until the next annual meeting.

MASSACHUSETTS DENTAL SOCIETY.

Forty-second Annual Meeting.

The forty-second annual meeting of the Massachusetts Dental Society was held in Jordan Hall, New England Conservatory of Music, Boston, Wednesday, Thursday, and Friday, June 6, 7, and 8, 1906.

First Day—*Morning Session.*

The meeting was called to order at 11.30 o'clock, Wednesday morning, by the president, Dr. J. J. F. McLaughlin, North Adams.

The reading of the minutes of the last annual meeting was upon motion of Dr. Maxfield dispensed with, as they had been published in the printed Transactions.

The secretary, Dr. C. W. Rodgers, then read the report of the Councillors to the effect that the following members had been elected as the officers of the society for the ensuing year:

President—Murdoch C. Smith, Lynn.
First Vice-president—George E. Savage, Worcester.
Second Vice-president—Ned A. Stanley, New Bedford.
Secretary—Charles W. Rodgers, Dorchester.
Assistant Secretary—Robt. Whitehill, Cambridge.
Treasurer—Joseph T. Paul, Boston.
Editor—Carl R. Lindstrom, Lynn.

The report of the Councillors was on motion adopted.

The president, Dr. McLaughlin, then read his annual address.

Dr. C. R. Lindstrom moved that a committee of three be appointed by the chair to take into consideration the President's address.

The motion was carried, and the President appointed as such committee Drs. Lindstrom, Taylor, and Maxfield.

The next order of business was the reading of a paper by Dr. W. H. Potter, Boston, Mass., on "The Need of Endowment for Dental Schools," as follows:

The Need of Endowment for Dental Schools.

It is a common experience with educational institutions of the higher grade that the price charged students does not cover the cost of the tuition furnished. This state of affairs results from the desire of educators to give their pupils not only the bare necessary training circumstances demand, but also the very best opportunities obtainable. There are, to be sure, educational institutions which are managed on a strictly commercial basis. In such institutions the cost of education always figures out less than the price paid for it by the student. What is termed a "reasonable business profit" is calculated on and expected in every transaction. Such institutions are sure to have a low requirement for entrance and a low requirement for exit. Consequently such easy conditions unfortunately attract many students, and they make possible the "reasonable business profit."

With such institutions we need not now concern ourselves, as they are able to take care of themselves. But to the institution which is trying each year to give more and more to its students in order to raise the quality of its graduates a serious problem presents itself. Such a policy is sure to raise the preliminary requirements, and also those for graduation, and in this way the number of students is diminished.

This policy offers increasing advantages to, while it requires more and more knowledge from students, causing a loss of income to the institution in so doing. It contains not an atom of business policy, and involves a financial problem which is a serious one. If dental schools were simply educational institutions and did not maintain infirmaries and oral hospitals, the possibility of conducting a school of a high grade would be small. As a fact, however, all dental schools must have a dual form of activity; they must be centers for professional teaching, and must also be centers of operative work, consequently they must be school and hospital combined. The infirmary and hospital side of dental schools should stand in an important relation to the needs of the community.

Let me enumerate what some of the dental needs of any large community are: (1) The extraction of badly decayed and diseased teeth; (2) the treatment of alveolar abscesses; (3) the relief of pain from exposed pulps; (4) the treatment of fractures of the maxillæ; (5) the regulation of misshaped dental arches; (6) the restoration of the functions of teeth by filling, or by the treatment of affections of the root-sockets; (7) the making of artificial substitutes for the natural teeth.

These are genuine needs of every community, and it is the privilege of the dental school to minister to the needs of those who are unable to pay for the services of a dentist. In order to do this work the dental school must have an endowment, and in the doing of it the school becomes a servant of the community, and therefore deserves an endowment. As a public servant the dental school should perform or organize services such as these:

(1) *The examination of the teeth of children in the public schools and institutions.* Such examinations are coming to be considered a public necessity in the best ordered communities. The dental school must also treat the teeth of many of the poorer school and institution children. This treatment must be nearly or quite without money compensation, and is a serious charge upon the dental school.

(2) *The care of the teeth of the sick poor.* A poor person who is sick can get free general medical help from a dispensary, but he receives only the crudest sort of treatment for the teeth. This treatment properly administered can only come from a skilful dentist, and as the dental schools are the natural source of supply for the skilled dentist who is ready to relieve the pain of the sick poor, this service, too, is a financial charge upon the school.

(3) *The maintenance of free clinics for the extraction of teeth and the treatment of surgical affections connected with the teeth.* Such a clinic is a necessity in every large community where poor people are massed together, and who devoid of the care of a free clinic would suffer much dental neglect and loss. This again entails a financial charge upon the dental school.

These three lines of public service are sufficient to indicate what is at once a financial burden to a dental school, and at the same time the real source of its strength. For the more freely the dental school accepts the demands for public service, the more will it deserve and receive public money in the form of endowment.

To summarize, then, I will say that a dental school having a high standard of education for its students, and generous plans for public service work, needs an endowment because—

First. It furnishes education which costs more than the student can pay, and in this it only follows the example of most educational institutions of a high grade.

Second. Because its public service work in hospitals, infirmaries, at the homes of the poor, and in the schools, is a financial burden for which the natural income of the school is not sufficient.

Discussion.

Dr. EUGENE H. SMITH, Boston. I believe all thinking men agree with Dr. Potter in that the necessity for the endowment of our dental schools is one of the most important matters that the profession should consider at the present time. The question that naturally arises after the reading of the paper is, How can we bring about these endowments? Now, there are in this audience representatives of different schools, and each one is naturally more interested in *his* school and the necessity of interesting himself toward getting an endowment for it. Then, next to having an endowment for your own school comes the advantage of having the same for another school. In other words, an endowment to any one school makes the endowment principle popular. It is up to us, so to speak, as men—as professional men, as graduates interested in our different schools—to so enlist the interest of the public that it will see the wisdom of giving substantial sums to dental schools.

The president in his address spoke along the line of the lack of knowledge and interest the average lay person has in the practice of dentistry and dental education, and it was interesting to me as I heard him discuss that point, for in last evening's *Transcript* I read a similar complaint on the part of a medical practitioner speaking in regard to his profession. Yet we look upon the medical profession as pretty well known. I mean that we consider the lay people much better acquainted with what the medical profession is doing than they are with what the dental profession is doing. And who are to blame for this? It is the practitioners of the dental profession. Therefore it behooves us to get to work to interest the people in our profession so that we may receive endowment for our schools.

Dr. E. S. TALBOT, Chicago, Ill. I must extend the idea a little farther than Dr. Smith and say the dental colleges are to blame. The dental college faculties, in my opinion, should take more interest in this matter. There is too much of the personal equation in dental colleges, speaking of them as a whole. The dental college faculties should first interest the alumni of the colleges in this matter, and they will then, as Dr. Smith says, interest the people at large in the matter of endowments. I see no other way of getting at the subject. It is nicely illustrated here at Harvard. The alumni association have interested men to furnish the money for the buildings already erected—I refer particularly to the new Harvard Medical School—and I should think that teachers in the dental department of Harvard college, and the graduates, would interest men of means in the direction of helping that department.

Dr. M. L. RHEIN, New York, N. Y. I do not know very much that is new on this subject that can be brought out, for the ground has been covered thoroughly by the essayist. No one can dispute the great advantage that would accrue if every dental institution were an endowed one. There is very little question in my mind that the fault, whatever there is, in the present method of dental education, results from the lack of this necessary endowment; the necessity that so many of the schools advertising to teach and graduate dentists have, of making ends meet from the income which they must receive, is unquestionably accountable for the demerits that exist in dental education throughout this country at the present time. Recognizing the beneficent effects that would accrue to the profession from this source, it is useless and idle for us as a professional body to close our eyes to the study of this question: we all know that institutions graduate men whom none of us approve of, and when we consider the large number of dental educational institutions that exist in this country, it covers a very large field. A couple of years ago, at the annual meeting of the American Medical Association, the president of the association made this question one of the leading themes of his introductory discourse as applied to medical education, and the principle of course applies absolutely to dental education. Personally I am an extremist on this subject. In other words, I am utterly opposed to what are known as proprietary schools, and think that if a vote of the profession as a whole were taken, they would eliminate from this country every educational institution that depends strictly for its maintenance on the revenue it receives, because it reverts from the scheme of the faculty the real thing that is to be obtained. The subject is one that is timely and should be thoroughly considered, and if it would accomplish this one purpose which the then president of the medical association said he would like to see accomplished—the extinction of every proprietary medical school—if we could accomplish this purpose in dentistry by endowing the proper educational institutions, the cause of dental education would be greatly advanced.

Dr. C. O. Kimball, New York, N. Y. I would like to say a word from the hospital standpoint. I have been associated with one of the New York hospitals for a good many years as a governor, and it has seemed to us there that we must use the hospital to some extent as a means for payment of the medical profession, by the public, for the services which it receives. We have established a course of lectures at the hospital for the purpose of teaching and training practitioners, and giving them the advantage of post-graduate instruction. It seems to me that the two things must work together; that any institution giving aid to poor people fails in its full duty unless it combine with that aid instruction for the men who serve. In this way the people needing help pay for their work by furnishing work for special instruction. That is the line that I wish to emphasize; that the dispensary side of the dental school pays back to the profession for services rendered, by the opportunities it affords in the study of diseases for the perfecting of men in their work, and therefore we may the more confidently ask for endowments because we are working two ways—we are relieving the poor, and giving knowledge to the men who are working in the infirmary.

Dr. E. A. Bogue, New York, N. Y. I have nothing to offer in discussion of this paper unless I reveal a secret, and it is that one member of our profession, who happens not to have a family of his own, has undertaken to set a college upon its feet with an endowment of two hundred and fifty thousand dollars, and connect it with one or another of the universities. This is a practical way of accomplishing what Dr. Potter has so graphically and reasonably advocated. I mention this only in the hope that there may be others of our profession who possibly may have fortunes of a certain size, who are willing to do the same thing.

Dr. Robert Whitehill, Cambridge. I am glad to say that it seems to me the profession is started on the right track in bringing this matter before such a meeting, and that the only reason of our dental schools today not being endowed is because the profession has not taken sufficient interest in the matter to see that they are. I feel that if the profession will at this time take up this matter in the systematic manner in which it has taken up others—the introduction of dental service into the army and navy, for instance—the greatest good may be accomplished.

Dr. G. A. Maxfield, Holyoke. I think Dr. Potter's paper is one of the greatest papers ever presented to the dental profession. The dental profession of America has gained its reputation through mechanics. It is simply through the progress of mechanics that American dentists are known throughout Europe. It seems to be the main idea of men entering the dental profession today to become proficient in the mechanical side of dentistry. Nothing discourages me more in meeting the men that I do, than to learn that if they can put in a gold filling properly they seem to feel that they have reached the extent of their dental education and practice. Now, if I thought my alma mater had not improved any since I graduated I should have very little to say; but I know that the majority of the dental colleges today have not improved any over those of twenty-five years ago—from my contact with the men who present themselves now to us for examination. This fact alone, it seems to me, makes apparent to all thinking men their duty to the profession. There must be endowments so that our students can be taught properly, and there must be money so that poor persons presenting themselves to the infirmaries can be treated, and the students receive benefit from the experience gained in this way from treatment of people who cannot afford to pay for it. The lack of endowment is one of the greatest drawbacks with which we have to contend today, and I hope we may yet see this endowment of dental schools an accomplished fact, as we will never be the profession we should be until this thing is accomplished. We must realize that dentistry is something more than the filling of a cavity in a tooth. Case after case comes to my hands from other dentists, because they have not realized the fact that dentistry embraces something more than that.

Dr. C. W. RODGERS, Dorchester. I am very much interested in the matter of endowments for dental schools, and it occurs to me that the only practical way of obtaining the desired result is to concentrate our efforts at first on one particular school. This idea was brought very forcibly to my attention recently by one of our leading business men of Boston during an interview on the subject. "What is your State Society doing in the matter of endowment for the dental schools?" he asked. And I replied that I did not think that the State Society, made up as it is of the graduates of so many different schools, would be particularly in favor of working for an endowment for any one given school. He said, "If your profession is not more liberal than that you will never have endowed schools."

It seems to me that the time is ripe for the profession to make an advance in this matter, and as a body co-operate in the efforts that the Harvard Dental School is now making. The members of the profession who have important practices among people of means, and who are desirous of giving money toward good objects, should take up this matter and concentrate their efforts on one school, such as the Harvard, and have that endowed. Then it would be easier to work along the same line and get endowments for other schools, and in this way accomplish a great deal for advanced dental education. It would be well if we could have men such as the one Dr. Bogue speaks of, who have sufficient means for the purpose; but receiving a few thousand dollars for a school here and there throughout the country will not help much toward the endowed dental schools. Let all concentrate their efforts on some one school, have that endowed, and the matter will be pushed forward and our desires obtained in a comparatively short time.

Dr. VIDA LATHAM, Chicago, Ill. I would like to emphasize the importance of this subject. I have been a student and teacher not only in this country but also in Europe, and I would like to offer one suggestion in regard to this matter. If you want endowed dental schools, how are you going to get them? Not only by legitimate advertisement, such as we have an example of here in working for the well-being and benefit of the public, but there is one other method that has not been touched upon. Why is it that the dental profession stands unfortunately, among the professions of the world as one of the lowest of the *reading* classes? Gentlemen, as a student and teacher, I am confronted with that statement very often, even among the booksellers. When you ask for certain books they say they haven't them, that they have no need for such books because there is no demand for them. What are our text-books? They are simply rehashes of the books of olden times, with but few exceptions. How many are acquainted with the work of Lepkowski on the "Distribution of the Vessels in the Teeth of Man"? How many men use that man's work—which has no equal in the world on the subject of which it treats? How many know of it? Very few. Yet we have rehashes from year to year, when we have a work like that coming directly from an authority who has made dissections of the jaws of the human body. It should be utilized, as well as the works of Dr. Rudolf Loos and Dr. Walkhoff. How is the medical profession upheld? How are men selected for the many teaching positions? By their scientific work—by their scientific articles—by the practical articles that they write. Men are known by the work that they do. Your own journal, the *Boston Journal of Medical Science,* is one of the standard periodicals of the world. The *Journal of Experimental Medicine* stands in the same class in its line of work. Why cannot encouragement be given to the men who are doing valuable work in our profession? and I indorse what Dr. Maxfield says, that we are retrograding in this country instead of advancing in certain lines. There is no greater harm done to dentistry than the abominable multiplicity of dental crown and bridge work, put in by men who could make good inlays and put in good gold fillings. If you will encourage men to write, to give us literature, practical literary work, and publish these articles to the world, you will soon get recognition from the public; you will get bequests from these men and from your university men for having pointed out new lines of thought, and therefore you will get the attention of the medical profession and the public in the same way. People say to me they never knew of these things when brought to their notice. It must be remembered that the public is our stand-by, and that these things must needs be brought to their attention. For instance, the importance and necessity of strict hygiene of the mouth: Those who have large practices cannot give the proper attention to educating patients in the importance and necessity of observing strict hygienic principles in regard to the care of the mouth, but they could aid the profession by turning over some of these patients to the younger men who have more time at their disposal, and who can give proper attention to this important work; and more especially will it bear good results when under their co-operation.

Dr. M. L. Rhein, New York. I would like to add one word, Mr. President, and that is that the real practical way for dentists to get endowments is to start these endowments themselves; that is, begin the work in the alumni associations of the different institutions, whatever the purpose may be. Now to illustrate that, I may add that in our dental department the alumni are just at present raising a fund of fifty thousand dollars by their own subscriptions for the purpose of erecting a dormitory building on the grounds of the university, which they consider that we especially need. Subscriptions from the alumni are being raised, and each man is contributing a certain amount that he is to pay, not at once, but he is given a certain number of years in which to pay this in annual instalments, and I have no doubt that we will have this fifty thousand dollars in actual cash in the treasury in five years, collected for this purpose from our own alumni. I simply want to inject this little practical point into the discussion. If we are going to our patients and ask for money for this purpose, let us show them that we are willing personally to contribute as much as is within our power.

Dr. Potter (closing the discussion). I had the privilege within the last six months of meeting a gentleman outside of the profession who is very much interested in our work; his name is Horace Fletcher. If you wish to find a man who is enthusiastic with regard to the importance of the dental profession, you should talk with him. Why is he so enthusiastic about the dental profession? Because he believes that the function of the teeth in digestion and nutrition is of the highest importance. Therefore the dental profession, having in charge the restoration of the function of the teeth and their preservation, is of the highest importance to humanity. If Mr. Fletcher's ideas become general, there will be no trouble in getting endowments for our dental schools.

The meeting then adjourned to meet at 7.30 P.M.

First Day—*Evening Session.*

The second session was called to order at 7.30 P.M., by the president, Dr. J. J. F. McLaughlin.

The first order of business was the reading of a paper by Dr. M. H. Cryer, Philadelphia, Pa., on "Some of the Factors that Modify the Human Jaws and Other Portions of the Face."

[This paper is printed in full at page 1071 of the November issue of the Cosmos.]

Discussion.

Dr. Eugene S. Talbot, Chicago, Ill. I am glad that one teacher in our dental schools has been able to follow my research work. For more than thirty years my entire time has been given to this line of work. At the beginning, I employed the law of the economy of growth, whereby an organ or structure is lost for the benefit of the organism as a whole. The essayist seems to lose sight of the etiologic factors in the cause of these deformities. Aristotle, four hundred and ninety-five years before Christ, laid down this law. Since his time many scientists have taken up this line of thought and have used the terms, "use and disuse of structures," "survival of the fittest," and at last Darwin brought out the theory of natural selection. It is true there are certain structures in the human body that are passing, namely, the little muscles of the ear, the small rib, the little toe, the vermiform appendix, and the pineal eye—or what we understand as students in the dissecting rooms as the pineal gland—now known to be originally the eye in the forehead of the lower vertebrates. This fact is laid down by scientists; namely, that from conception the fetus passes through all the lower types, from fish to reptile, from bird to mammal. If from any cause—such as excesses—there is produced in the parent an unstable nervous system, arrest of development takes place in the offspring. This is the case in animals as well as in man.

The structures that are passing are transitory, and transitory structures are the ones involved when the nervous system of the parent is unstable. You know how, under the law of use or disuse of the structures, the right arm of the blacksmith becomes larger and stronger than the left, and how the legs of the mail-carrier become larger than normal. In the illustrations showing the evolution of the dog, the upper jaw became arrested in development, while in the lower jaw there was a reversion to the lower type on account of its being used more than the upper. The theory of the use and disuse of structures is applicable to man; the brain is developing, while the jaws are becoming arrested in development for the benefit of the brain. Because the lower jaw is movable and the upper is fixed, on account of the unstable nervous system in some individuals arrest of development takes place in the upper jaw while the lower remains normal; or it may become arrested in development and take the type, not of the mother or father, but of some one of the ancestors. These laws hold good in dentistry as well as in any other department of science, as they are fixed laws.

Take the picture of the skull of the bulldog which the essayist showed on the screen; it would stand to reason, if arrest of development of the face takes place, arrest of development of the bones of the nose, including the turbinates, occurs. On account of the unstable nervous system, added to the evolution of the face, as mentioned in the paper, an insufficient as well as an excessive development sometimes takes place. Adenoids are due to an unstable nervous system, and are dependent on excesses as well as arrests of development. The causes that produce such conditions in the jaws also produce the same conditions in the nose, including hypertrophy of the turbinates and adenoids. The unstable nervous system in relation to embryology and evolution accounts for all the pathologic conditions of the head, face, jaws, and teeth, including pyorrhea and interstitial gingivitis. When we once become familiar with the principle of embryology and evolution, we will find that all pathology will be easily understood.

Dr. M. C. Smith, Lynn, Mass. The development of the jaws and face is a subject to which I have given a great deal of thought and study. I am not quite prepared to accept the theory that has been laid down to us by some of our writers, who claim that the evolution of man will eventually result in the loss of a portion of the teeth. The teeth of the American-born people are decidedly on the side of improvement. The best type of teeth we have today are those of the American people, viz, well-developed third molars. Numbers of people come down from among the hills of New Hampshire, Vermont, and some from Maine, that have good teeth. I would be surprised to see a set of poor teeth in the mouth of a patient who could trace his ancestry back eight or ten generations on American soil. But I will tell you where you do find poor teeth. If you find an American-born child who has four ancestors born in four different European countries, look for a set of poor teeth. If you discover two ancestors from different nationalities, you find poor teeth. Take the Swedes, who come here with good teeth; in a few years these teeth are practically gone, it being utterly impossible to save them. I have been looking forward to the time when I could find a set of teeth in persons from Sweden who could trace their ancestry back four or five generations in this country, and then I expect to see good teeth.

I was a little surprised to hear the essayist of this evening refer to thumb-sucking as the cause of deformity of the mouth. In all my experience I have seen just two cases in which I attributed the deformity of the jaws to thumb-sucking. I do not think the latter is any factor whatever in the deformity of the mouth. Put your finger in your mouth, and you will find that in the physiological action of sucking it, the stress will be upon the muscles of the face and lips, and that the act tends to draw the teeth backward.

There are some other points of which I wish to speak. Do we lay enough stress upon adenoids? We can trace many of the ills and troubles of the mouth back to them. If I see a child three or four years of age having teeth all decayed down to the margins of the gums, I look for adenoids, and always find that they antedated the destruction of the teeth.

There is also one other subject I would like to speak on tonight, viz, the disease classified by medical men as myxedema. I saw a little patient today afflicted with this disease, a child ten years of age, and in that child there is a development of the tooth-structure corresponding to the normal development of a child seven years of age. Of what importance is that as bearing on the development of the teeth of the American race? I think all of us can look back in our experience and see many undersized persons who are decidedly below the average in mental development, whom we can now consider as cretins. What is the condition of their teeth? I saw a patient not long ago, thirteen or fourteen years of age, with a development of tooth-structure corresponding to that of a child of eight or nine years of age. I would like to hear some remarks from Dr. Talbot, as he has probably spent more time on this subject as to the effect of cretinism upon the development of the teeth than any other writer.

Dr. THOMAS FILLEBROWN, Boston. I do not feel competent to say much upon this subject. During nearly all my life my efforts have been to restore the inroads of degeneration, and I have not given much attention to the development of the human organism, or other organisms, through any of the popular conceptions of development. My feelings have always been that the theory was a little overdrawn. I fully agree, however, with the proposition that all biological products arise from a common protoplasm—uniform cell life. Some influence is centered upon a set of cells to make the human being, then they become subdivided, and under certain influences one cell makes one tissue and another cell another, and so on for the multiple tissues that are found in the human body.

It is much easier for me to imagine the initiatory force of the creative power forming the type, than to ascribe all to environment. I can understand that environment may modify and develop after the type is formed.

While I believe that they are all made from one common protoplasm, yet just how it is done I will tell you when you tell me the secrets of all creation and the motive and intelligent force of the Creator. I have heard it stated, I do not remember where, that the many fine things we see, such as beautiful flowers, fine-bred horses, and fine-bred people, are degenerates. The wild potato as first found was not edible at all, but by careful breeding it has been developed until we have perhaps one thousand varieties of the most palatable and the most useful vegetable that we have. Many flowers taken in their wild state would hardly excite our admiration at all, but see what has been done by careful cultivation and careful breeding; they have been made the most perfect of products. Now I call all of that instead of degeneracy, perfection; perfection brought about by applying the influences that nature has put into our hands for this purpose.

Dr. G. P. Wiksell, Boston. I think we might perhaps change the term thumb-sucking, as I watched two or three of these cases, and found there is not so much thumb-sucking, but more of a thumb-pressing. I have seen little boys for hours pressing their thumbs into the roof of the mouth in such a manner as not only to change the shape of the mouth, pressing forward the bony structures, but also altering the shape of the thumb. There is no doubt at all about that habit changing the shape of the mouth; it is not merely the putting of the thumb in the mouth, but a continual pressure on the alveolar process. Of course most of these habits are broken before the child is very old. We have a metallic mitten made for this purpose; but where the habit is continued, as in some cases, until the child is ten or more years of age, there is no doubt that it affects the structure of the face.

In regard to the bulldog, I do not think that its evolution has anything to do with the case at all. The breeding of this dog is from the lowest and worst types, and the worst type is developed. But it is very easy to breed a handsome dog from the finer types, as is beautifully shown in the pictures.

Dr. H. C. Meriam, Salem. I think we are somewhat in the position of the clergyman who thanked God for Darwin's theories because everyone could talk about them. In this question of development is involved an enormous plan that we cannot observe in a lifetime; however, many of the variations we can see. A century of life, if we had it, would be but a short time in which to note the modifications of human beings, but we are perfectly right in assuming that the laws of protoplasm follow through all forms of life. From the vegetable to the animal the link is very close. When you think that it is possible to anesthetize a sensitive plant so that it will not act, we can then see how nearly like the animal protoplasm is that of the vegetable. I have myself seen, in my love for gardening, many of the changes possible in plants and flowers. I remember some twenty-five years ago when the red pansy first appeared. It was at that time the feeblest plant in germinating power. Its seedlings would be attacked by insects when others were left alone, and it would produce a larger proportion of what were called "rogues" than any other pansy I grew. These rogues seemed to be inferior to any pansy that I had ever seen. They were so mean and feeble that they could not lift their heads from the ground. Now, gentlemen, in Paris that defect has been eliminated, and the red pansy has become a fixed thing. It is as beautiful and strong as any type of pansy and has become fixed. In that we have seen the results of careful breeding and selection.

And now comes Professor Bailey, who is perhaps our leading authority on these horticultural subjects in America, and he has realized that this is no accident in plant-culture, but that it is the product of intellect and breeding, with a very strong emphasis on breeding. He says, for instance, if he wishes to produce a certain type of tomato, he will select from a large number only those nearest to what he has as an ideal, and then cultivate these, and select from this crop only those nearest to what he wishes to produce, and in four years he can produce his tomato. Now can you say that that is an accident, or can we assume that it would happen in evolution? I think not, and it places man almost in the position of a creator. Certainly we cannot say that without the arbitrary interference of man in that culture this particular tomato would be produced, but it has resulted from breeding, with almost no action on the part of the plant in the matter, excepting as it assumes control over the function of the protoplasm in perfecting this. So that we can say that creation still holds a very strong control in "evolution." Thus this term has become very general and ridiculous. We hear of the evolution of the chair, or the evolution of a table—and man has done that too. I think, however, that this extreme idea of evolution is passing, and we are coming to recognize the fact that types can become fixed. I think Dr. Smith has touched upon that point, to the effect that we could take people with poor teeth, and in three or four generations could produce healthy and perfect teeth.

There is another point that I wish to speak of in reference to the pansy, and that is the power it has of perpetuating itself. If the particular pansy I speak of were grown in what is called a field culture, there would be a single seed-pod in a whole bed. And there comes in the question that Dr. Clark brought out years ago, that no race had obtained permanent foothold on the American continent. He said he believed that there were evidences everywhere that the Indian was not the original inhabitant of the American continent. Certainly at the time of its discovery it was one of the most sparsely populated countries in the world, and whether it be due to the American atmosphere, or whatever may be the cause, we certainly are not able to show a persistent type of American. We are a people who are importing our population, instead of rearing it. Our ladies with their charity organizations everywhere are freely adopting the wholesale system of nursing, and we are rearing our children in the best way we can to make them American citizens. Now what is the basis of human life that we may give it a persistent type—that our days may be long in the land given us? Can we say what is that happy medium, so that it may live and endure on the American continent?

Dr. CRYER (closing the discussion). When asked to prepare a paper on "Some of the Factors that Modify the Human Jaws and Other Portions of the Face," I was somewhat at a loss to know in what manner to take up the subject—just what points it would be best to consider. I presumed that Dr. Talbot of Chicago would be in the audience, and knowing that he had given the subject considerable thought, it was my desire to offer a text that would give him an opportunity to elaborate upon the points at issue, and I therefore appreciate what he has said to us in this discussion. I am also pleased to have had Dr. Meriam of Salem, Mass., speak of the influences causing the variations in plant life. Dr. Smith has just said that in his opinion the teeth of the American people have not deteriorated. From the experience gained in the dissecting room one would be strongly inclined toward this view, as better teeth are found at the present time than can be seen in the ancient skulls in the various museums of this country or Europe.

In the collection of recent skulls in the working museum of the Dental Department of the University of Pennsylvania, much better dentures as to shape, size, condition, and position of the teeth can be found than in any collection of ancient skulls that I have been able to examine. Many specimens show not only thirty-two teeth, but upper rudimentary fourth molars, and in one case a lower rudimentary fourth molar.

Another point drawn out in this discussion is that of thumb-sucking. It is not so much the act of sucking the thumb that causes the change in the shape of the jaws as it is the act of keeping the jaws apart. If we wish to "elongate" the "bite," an appliance is placed in the mouth which prevents the teeth that are to be elongated from coming into occlusion; on the same principle, if the child is constantly sucking the thumb there will be an elongation of many of the teeth, and when the percussive force of the teeth is interfered with there is naturally a narrowing of the arches, and this act alone has a tendency toward protrusion. It is necessary to have proper occlusion of the teeth in order to have proper formation of the jaws.

(To be continued.)

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EDITORIAL DEPARTMENT.

CONCERNING ANESTHETICS IN GENERAL AND COCAIN IN PARTICULAR.

THIS journal has always maintained a conservative attitude with respect to the administration of anesthetic agents in dental practice, and as a consequence has frequently expressed its disapproval of their indiscriminate or careless use. It is not intended that the foregoing statement of our attitude toward the general question of the use of anesthetics in dentistry is to be interpreted as being in any degree antagonistic to the legitimate and intelligent use of these important agents. It is exclusively with respect to their misuse that our criticism is directed. It is mainly a question of where, when, and how to draw the line between the right and wrong use of these agents that directly concerns us.

The scientific study of physiology and of pharmaco-dynamics has not as yet revealed the exact mechanism of anesthesia. We do not know how the so-called anesthetic agents act in the production of their characteristic effect. The chemistry and physics of protoplasm, and its action with reference to its vital manifestations and relations, must needs be more intimately investigated and determined before we can clearly understand the action of drugs and be in position to more safely and certainly use them. But this much we do know about anesthetic and analgesic drugs, viz, that their action is, in general terms, to paralyze the functional activity of the protoplasm of certain cells; the definite and marked sensory paralysis which they produce being their chief characteristic and that which gives to them their value as annihilators of pain.

The power of these agents to destroy pain by inducing a temporary sensory paralysis is, however, not by any means the limit of their paralyzing power. Increase of their action by the administration of doses larger in amount or spread over a prolonged period of time will ultimately bring about a corresponding motor paralysis, and, if the action be further intensified, paralysis of the involuntary muscular activities that control the cardiac and respiratory function, and lastly that total and final paralysis of all function which is the other name for death.

The factors involved are necessarily complex, and their interaction develops almost an infinity of material conditions to be met with in practice. The number of agents and combinations of agents now known and used for anesthetic purposes is comparatively large. Many of them are still decidedly within the experimental stage, for the reason that their mode of action is unknown and their dynamic factor has not been worked out. This multiplicity of agents and their almost limitless possible combinations creates in itself a large element of uncertainty in regard to the general problem. When we add to the foregoing the infinitely varied degrees in which the human organism reacts toward the toxic effects of these preparations, how vital resistance is modified by heredity, by environment, by food habit, by disease conditions, by the temporary factors of traumatism, shock, etc., the conservative and thoughtful practitioner may well pause and take time to consider the seriousness of the problem before him when about to administer an agent which by the very nature of its action sends his patient a definite number of steps upon the road toward that bourn whence no traveler returns.

It is a moral question, an ethical problem of the first magnitude, which may be expressed in some such terms as, How far are we justified by the conditions presenting in dental practice in administering anesthetics for the relief of the pain factor? We admit at once that the use of anesthetics in dental practice has, *per se*, just as much warrant and justification as their use in any other department of the art of healing; but we wish to emphatically defend the proposition that the question of their use or otherwise is to be determined solely by the administrator upon the merits of the case, and not upon the whim, desire, or timidity of the patient. The fact that a patient "demands an anesthetic" can never be the justification for its use, and much less can the patient's choice of the agent be the warrant for its selection by the operator. That anesthetics are administered for exactly these reasons: "Because the patient wanted it;" "because the patient preferred this or that agent;" because a particular agent is or is not a "practice-builder" or a "money-maker"—God save the mark! —are among the reasons given in recent dental literature by men who with the courage of their ignorance have thus sought to justify their use of certain anesthetic agents. Theirs is the type of mind that we have upon a former occasion referred to as the kind that would not have been benefited by listening to a course of lectures on ethics during their college career. It is a case not of immorality but *a*morality.

The choice of a particular agent is to be made upon the basis of its safety and of its adaptability to the case under consideration, both of which presuppose that the administrator is fortified with a knowledge of the nature of the agent which he selects, its mode of action, its limit of dose, its record of safety, and the antidotes and means for combating its dangerous effects; these on the one hand, and the physical condition and health status of his patient on the other. This applies to all cases where it has been decided that the induction of anesthesia is justifiable.

But there is the precedent question of whether the demand for painless dentistry by the use of anesthetic agents acting through the general circulation is a sufficient warrant for such general use of these drugs. The history of cocain and its allied preparations is an interesting and instructive one. Much experimental use of cocain and incident loss of human life had to be gone through with before the reasonably safe physiological dose could with any approach to accuracy be determined. Moreover, it was found that an amount which under one set of conditions could be safely injected would prove fatal under other conditions, depending apparently upon the relative areas of surface affected by the drug. The maximum physiological dose had to be determined and the minimum dose capable of producing an operable anesthesia as well. But with these factors fairly worked out, it was nevertheless found that many cases of subsequent sloughing of the soft tissues ensued when cocain solutions had been injected previous to the extraction of diseased teeth. The cause was sought in possible infection of the solution used, or of the hypodermic needle. Elimination of these possible sources of infection and surface sterilization of the territory of operation did not in all cases prevent subsequent necrosis of the soft tissues into which the drug had been injected. It has been found that sloughing is most prone to occur in cases where extraction is sought as the means of relief from pericemental inflammation in the acute stage, where the burden of the toxic action of the cocain is added to that generated in the tissues themselves by the pathogenic bacteria responsible for the inflammatory action which rendered the extraction of the tooth necessary. It is just such cases—those already poisoned by the end-products of the bacteria of inflammation, those in which the inflammatory action has already brought the soft tissues to the verge of necrosis—that an injection of cocain adds the further increment of toxicity necessary to destroy the cell vitality of the part and produces sloughing. Cocain in these cases is, we think, definitely contra-indicated.

We would go a step farther in criticism of the tendency to eliminate the pain element as a routine measure in all cases of dental treatment in operation. Frankly admitting that many dental operations are productive of a degree of pain which is beyond the limits of ordinary endurance, and that to inflict such a burden of pain is, or may be in many instances, damaging to the nervous system of a delicately organized patient, there is on the other hand much easily bearable suffering from dental operations for the relief of which an anesthetic is not only not needed, but where on moral grounds we believe its use to be distinctively wrong. The moral point at issue is this: It is manifestly impossible to eliminate from the conditions of human existence the demand which circumstances inevitably make from time to time upon the organism to bear pain in some degree, great or less. The resort to anesthetics, or other artificial means for escaping the primal curse, is too often a device which "makes cowards of us all," by destroying the powers of both moral and physical resistance to the ordinary stress of life. There is a danger in this tendency to continually "sugar-coat" disagreeable human sensations, because it will in time destroy the power of human endurance.

For the foregoing reasons, among others, we are of the opinion that the recommendation made by Professor Touchard, of whose article we present a review in this issue (see page 1264), is open to serious criticism. He, in brief, recommends for the relief of pain in excavating carious dentin that a dilute cocain solution be injected into the tissues about the root-apices, with the object of securing anesthesia of the dentin through the pulp. That dentinal anesthesia can be thus secured is unquestionably true, but it could also be brought about under the general action of chloroform by inhalation, which would hardly be considered a justifiable proceeding under the circumstances. It is not any question of the possibility of doing it, but rather of the propriety of doing it, that we wish to discuss.

The method described and recommended by Prof. Touchard has already been used and exploited by others, notably by Prof. Sandblom of Christiania, Norway, who early in this year submitted to this journal a well-prepared article on the same method, but which we advised him not to publish until further experimentation had justified, or otherwise, the use of it. It is doubtless true that in intelligent and skilful hands the method may be succesfully employed, but it is objectionable, we think, for the reason that in the hands of the ignorant or careless it might do harm. There are many other methods by which the pain of cavity excavation may be brought within bearable limits—methods which do not involve injection of a poisonous drug into the circulation, with its attendant risks of septic infection; and while from a scientific point of view the method described by Touchard is interesting, and while it may have a useful place in isolated and extreme cases, we consider its promulgation as a method to be generally employed as one fraught with large possibilities of danger. We regard it as wrong on moral grounds, because it panders to that weakness of nervous resistance which is the basis of inebriety, hysteria, low moral tone, and loss of vigor, which in its protean manifestations is so insidiously undermining the social fabric.

Somewhere we have seen recorded the case of a rich old dowager of the hysterical type, who employed a physician to travel with her in order that he might be at hand to promptly administer chloroform to her when the train passed through tunnels, her nervous system not being capable of enduring the stress of the tunnel experience. We are in certain directions rapidly reaching a similar condition, and the dental profession is a contributory factor thereto in cocainizing humanity for every disagreeable sensation from which the hysterical or morally weak desire to escape. Pain within reasonable limits is a moral tonic, and as such is to be utilized just on the same principle as physical exercise, bodily work, is utilized to develop a sound physical organization.

BIBLIOGRAPHICAL.

Atlas and Epitome of Dentistry. By Prof. Gustav Preiswerk of Basel. Edited, with additions, by Geo. W. Warren, M.D., Professor of Operative Dentistry at the Pennsylvania College of Dental Surgery. With 44 lithographic plates in colors, 152 text illustrations, and 350 pages of text. Philadelphia and London: W. B. Saunders Company, 1906. Cloth, $3.50 net.

This book is evidently written from the medical standpoint; that is to say, it is a work on dentistry by a medical man whose dental knowledge is apparently a secondary outgrowth from his medical training. As a consequence the larger portion of the work is taken up in studies of structure and the description of normal and morbid processes connected with the dental organs and their associated parts. The work contains 326 small octavo pages, within which compass the author has made a serious, indeed almost violent, attempt to compress the whole subject of the structure, comparative anatomy, histology, physiology, pathology, surgery, therapeutics, and prosthesis of the teeth and all of the associated organs and tissues.

Much of the teaching is defective, and the American editor has made an attempt by means of footnotes to correct some of the statements which will be generally regarded, in America at least, as erroneous. For example, the author describes two disorders, namely, infantile odontalgia and infantile odontitis. The first is a condition which he describes as being

> due to the toughness of the gum, which offers great resistance to the erupting tooth. Pressure is thus caused upon the still exposed dental pulp, and therefore the child suffers from toothache even before the tooth has penetrated the gums. In such cases the gum itself is not involved. . . . The treatment should be expectant—that is, postpone treatment and watch whether the tooth will appear in the mouth without interference. As soon as this occurs all pain disappears. If, however, the symptoms of general disturbance become pronounced, it is advisable to relieve the condition by making a deep incision through the tightly stretched gum.

The second disorder, *i.e.* "infantile odontitis" is a

> type of difficult tooth-eruption contrary to the preceding form; symptoms referable to the gums are the most prominent. In infantile odontitis the pain is not caused by the compressed dental pulp, but by the condition of the gum. This structure is primarily inflamed at the seat of eruption; later, however, the inflammatory process spreads to the surrounding tissue, so that finally a large area becomes involved and highly sensitive. . . . . Treatment is not always necessary, since, like in odontalgia, the disease process often ceases when the tooth is erupted. Under no circumstances should the gum be incised, for such procedure may easily result in sepsis of the irritated mucous membrane. It is better to try to lessen the inflammation with a mild antiseptic solution.

for which he prescribes a mixture of *one dram of borax to the fluidounce of rose-water.*

We criticize certain features of this teaching; first, as to terminology. What the author calls "infantile odontalgia" is perhaps quite correct when measured by the standard of his own conception of the difficulty, but according to the symptoms which he describes it is an infantile pulpitis of traumatic origin, the odontalgia being a symptom of the disease which he describes. The disorder which he calls "infantile odontitis" is not an odontitis at all, for he distinctly specifies that the teeth are in this instance not involved, but the gums; therefore it would be a ulitis and not an odontitis. We interpose our objection to his expectant plan of treatment for the simple reason that the author does not indicate a sufficient knowledge of the character of the disorder which he has described to justify his reliance upon the expectant plan. To justify one's reliance on the expectant plan one ought to have a sufficiently expert knowledge of the conditions surrounding a case to know what to expect; or, briefly, the utility of the expectant plan is largely a question of who is doing the expecting. In the case under consideration we fear the author would be likely to run up against the, to him, unexpected —namely, a sudden attack of convulsions, with possible fatal consequences—convulsions which he elsewhere designates as "tooth cramps." We submit that an explosive outburst of a much-irritated central nervous system in the teething infant is rather a more serious proposition than would be implied in the designation "tooth cramps."

We are up against some rather hard propositions that present themselves in this book owing to what we suspect to be the untechnical character of the translation. For example, at page 117, there is a section devoted to the discussion of "decubital ulcers." Upon refreshing our editorial memory with regard to the word "decubital," we find that it means, when applied to an ulcer, what is commonly called a bed-sore, yet in this dental work these bed-sores are described as occurring in the human mouth due to the pressure of "tight dental plates or too tight corrective apparatus, as well as hard tartar and the points of carious teeth." The pathological condition referred to may be quite analogous to that of a bed-sore, but the terminology is not happy. Oral bedsores are a novelty on this side of the Atlantic.

The author adheres to the theory that erosions of the teeth not dependent upon mechanical means, and which by the way he terms abrasions, are due not to the solvent action of acids but to the destruction of the organic basis-substance of the teeth. We have not space at our disposal to go into a discussion of this question, but will simply state that after he has investigated the subject somewhat more fully the author will in all probability change his point of view.

Much space is given to a discussion of the etiology of caries, as well as to the early researches which have served as the basis of modern and accepted views on that question. In the matter of cavity preparation in the section upon the operative treatment of dental caries not a word or suggestion is given as to the importance of considering the form and position of the prepared cavity with reference to the problem of recurrence of the carious process. The whole subject of cavity preparation is dismissed very briefly and is treated exclusively from the mechanical standpoint, apparently with the object of securing good retention of the filling and exclusion of the nutritive material upon which the bacteria of decay may flourish. In these modern times the operation of cavity preparation is generally performed with due regard to the bacteriological factor in its relation to areas of relative immunity.

In the discussion of the etiological factors responsible for malformations of the dental arches and maxillary bones the important subjects of mouth-breathing and the influence of adenoids in causing arrest of development of the maxillæ is dismissed in four lines.

The book is strong in the features relating to pathologic processes and their etiology; it is lamentably weak upon the side of operative treatment. It is marred by certain defects of translation to which we have already alluded; another instance in point being the description of plate 24, at page 230, where it says, "This illustration shows us a not very infrequent condition in which the front incisor tooth is so badly destroyed on both sides by the deep carious process that one is tempted to remove the remainder of the crown." We presume the author means the central incisor, but as there are no back incisors, or in other words all incisors are in front, the designation is not specific.

The book is profusely illustrated with colored plates many of which have more to commend them in the way of brilliant color effects than in the matter of illustrative value. The faithfulness of photographic reproductions commends them above all other methods for scientific illustrating, and in most modern works they have, simply upon the score of accuracy, displaced the uncertain though otherwise attractive efforts at so-called artistic effects in color.

In view of the large amount of literature on the subject, in view of the existence of many good text-books already in the field, we fail to see the justification for the publication of a treatise of this character, except it be for the enlightenment of physicians upon a number of important dental subjects about which they should know. The work is certainly not adapted to the needs of the dental practitioner either as a text-book or as a work of reference.

The Teeth and Their Care. By Thaddeus P. Hyatt. New York: The Dental Publishing Co. Price, cloth 50c., postage free.

This little book of forty-three pages is a creditable effort to popularize some of the important data with reference to the care of the teeth. The teaching throughout the work is orthodox, and is presented in phraseology which is divested of technicalities, and in a plain, simple, and straightforward diction that should make its teachings readily understandable by those with no technical knowledge of the subject.

Our only criticism upon the work as a whole is its brevity, as we believe that it would accomplish more good if some of the subjects were more fully elaborated.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by **JULIO ENDELMAN, D.D.S.**

[*L'Odontologie,* Paris, September 15, 1906.]

NEW WAY TO APPLY COCAIN IN DENTAL PRACTICE. By F. Touchard, Professor in the École Dentaire of Paris; Dentist to the Seine Asylums.

In a communication to the Academy of Medicine the author says that recent discussions in that society as to the value of cocain do not seem to have modified the opinions either of its admirers or of its detractors. He himself has for some time been an advocate of the employment of cocain anesthesia by the dentist, and anticipates that the drug will be of still more value to the profession.

Up to the present, so far as known, the analgesic action of cocain has only been applied in the extraction of teeth, the principal indications for its use being timidity of the patient or difficulty of extraction. Cocain remains, the author claims, the favorite analgesic, as it can be used always and everywhere—its administration, when regulated by a detailed but non-complicated technique, insuring the elimination of failure or accident.

The pain of extraction will be of short duration, if there be no complications; but if the conformation of the tooth require separation of the roots, or prior operative procedures render the extraction more laborious, it is otherwise, and then the value of anesthesia will be appreciated. The duration of cocain anesthesia is here an important factor. The general anesthetics employed in dental practice—such as nitrous oxid and somnoform—can be administered only for a limited period of anesthesia—too short for our purpose. Again, the administration of chloroform or ether offers inconveniences in dental practice that offset any advantages that might be obtained.

In the presence of convincing results in one thousand cases of extraction, it seems to the author but natural that the benefits of cocain anesthesia should be utilized in other cases.

M. Reclus, in 1894, in his book on the use of cocain in surgery, stated the problem clearly, and was astonished that the very simple procedure was not taken advantage of in current practice. He says: "Dentists, in having recourse to cocain, anesthetize the tissues when they desire to extract a tooth, yet they abstain from its use in those painful cases in which they either extract or destroy the pulp by means of broaches or caustics. Why not, then, practice deep injection to the level of the roots? Certainly these injections prove efficient. They so act upon the nerves that lead to the pulp that although in extraction these nerves become stretched and torn, the patient does not experience the slightest suffering."

The author does not think that the advice of M. Reclus has been taken advantage of and applied with definite purpose for the alleviation of pain as it might have been in the treatment of various pathological conditions. We have hesitatingly made the experiment of bringing a relatively concentrated solution of cocain into direct contact with a diseased pulp. The same is true as to the addition of cocain to other preparations which have a rather variable action with the idea of suppressing the pain that makes their use necessary—as in devitalization of the pulp. The application of tampons of cotton soaked in a ten per cent. cocain solution to modify the sensitivity of painful dentin in caries of the second degree has but a doubtful influence, even after twenty minutes' contact.

The indications and counter-indications for the use of cocain seem clearly established by the following case: A patient called to have a tooth extracted. Upon examination it was found that the tooth required simple conservative treatment, the caries being only of the second degree. The patient was nervous and timid, and the pain in the tooth was so acute that she insisted upon its extraction, because of her fear that the pain should increase. Injections of cocain were made in the gum as is usual in the technique of extraction. Now, while the cocain was acting, the patient became comfortable, and decided to retain her tooth. Accordingly, beginning the work of excavation for a filling operation at once, the operator was much surprised—as was also the patient—to find that the contact of the instruments, which had previously caused so much pain, was felt merely as a vague sensation of touch. The diseased dentin was removed, and the cavity at once prepared and then filled, all being effected without causing the slightest pain.

Greatly impressed thereby, Prof. Touchard resolved to apply cocain anesthesia to any of the various painful conditions he might be called upon to deal with. The treatment was experimentally applied in the most diverse cases, with excellent results; he now feels that he possesses a simple and practical method of assuaging pain, by means of which the needed treatment of dental caries may be rapidly accomplished. In hypersensitiveness either of the teeth or pulp, particularly in the case of nervous patients, it is an advantage to have recourse to cocain anesthesia.

He tabulates twenty observations, taken from fifty cases, and says: "The reading of the annexed observations will make this latter point clearer: You can follow the progress of insensitivity step by step, and although too much stress may seem to be laid on this point, it is a fact that no matter what the work to be done or condition present—excavation of softened and sensitive dentin, removal of diseased pulp, whether inflamed or not, extraction of the contents of root-canals—no matter which tooth was treated, satisfactory results were obtained."

The degree of emotion in the patient, particularly in women, was an additional reason for resorting to analgesic methods, and he has not found that such a course offers the slightest inconvenience, the patient becoming calm from the moment of realizing cessation of pain. He has not only not observed any accidents, but even any untoward incidents whatever, due to the action of cocain.

He feels that these uniformly successful results are due to the application of a well-regulated technique, and gives the following as his own procedure: The solution employed is a weak one, as advised by M. Reclus. A mixture of cocain hydrochlorid and eucain is generally used, as follows: 1 cc. of the solution contains 15 mgm. of cocain hydrochlorid and 5 mgm. of beta-eucain, the latter being added to counteract the vaso-constrictor action of the cocain. Recourse has likewise been successfully had to the oily solution of pure cocain, as suggested by Poinsot.

Finally, in the case of a highly congested condition of the diseased parts, rendering the effect of the cocain on the inflamed areas uncertain, the best results have been secured from the addition of adrenalin to the cocain. Adrenalin seems to limit and thereby reinforce the action of the cocain; its action may be likened to that of the elastic ligature placed at the base of a finger into which cocain is to be injected. Adrenalin serves as a vascular ligature, so to speak.

Two conditions must be observed in order to obtain complete anesthesia: By means of injections circumscribe carefully the tooth to be extracted, and ascertain accurately just when complete anesthesia is established. The majority of the failures registered against cocain are due, he believes, to the non-observance of these details.

The technique of the injections is likewise important; attention should be given to every minute detail. It is not always an easy matter to make an injection in just the right place, in tissues which are frequently no thicker than the diameter of the needle. Steel needles should be used, very fine and sharp-pointed. Needles of platino-iridium, although their sterilization by means of the flame is very easy, have the inconvenience of being less keenly pointed, and they appear, when seen in the same lighting, of heavier diameter than the steel needles. Steel needles should be sterilized by immersion in chloroform for a quarter of an hour—or, better, in a drying-stove.

The injection becomes more difficult in proportion to the depth of the root; it is also more difficult when upon the external surface than upon the internal, and in the lower than in the upper jaw. It should be made slowly, the needle being inserted more and more deeply until it has penetrated to a depth of about 2 cm. in the direction of the apex of the root, keeping it as near the periosteum as possible. If the injection has been well made it will not be long before the gum assumes a characteristic whitish tint, and at the same time its sensibility disappears. The sensibility of the tooth subsides gradually through a period of time varying from two to fifteen minutes. The anesthesia lasts from ten to forty minutes—sometimes more—gradually disappearing, the first part to come from under its influence being the most sensitive, viz, the pulp. While it lasts the operator usually has time for the performance of the otherwise painful parts of the operation; but if further anesthesia be necessary another injection will supply it, providing that the prescribed danger zone be not overstepped, *i.e.* that the total amount of cocain injected does not exceed the safe physiological dose. A cocain injection not exceeding a total dose of 0.05 gm. in a single sitting will occasion neither accidents nor incidents; still less will there be reason for fear, if a weaker solution be used. The after-sensations following the operation are only such as would follow any operation, whether cocain be used or not. The injuries inflicted on live tissue by the procedures necessary in an ordinary filling are always followed by a few hours of discomfort, rather than pain. What is of importance to know is that the rapidity of cocain treatment—which to some extent enables us to surmount obstacles—by no means implies any increase of subsequent pain.

The exact physiology of dental anesthesia by cocain is still to be established. Taking into consideration the vascular and nervous wealth of the periosteum, its connection with the gum on the one side and with Tomes' fibrils on the other, and the latter in their turn with the pulp, there is every reason to believe that cocain acts gradually, anesthetizing first the peripheral parts and reaching the center last. In favor of this hypothesis is the fact that after a gingival injection the dentin is anesthetized before the pulp. As regards the exact action of cocain on the nerve elements, as indicated by M. Dastre, it is comparable to a "curare" acting upon the nerve terminals. The ignorance under which we labor as to where the nerve fibrils of the tooth end forces us to remain without complete demonstration of this. Possibly cocain may act directly on all the dental tissues, by suspending the activity of the cell in each case. Even though the exact progress of the anesthesia be not scientifically established, the anesthesia itself is practically apparent in the whole extent of the tooth.

In two cases of failure reported, both being cases of acute pulpitis, the cocain injection anesthetized the dentin, and the pulp was reached without pain; but as the latter remained sensitive, recourse was had to slow devitalization by means of arsenous acid. In these two cases the solution of cocain and eucain was used. In two other cases of acute pulpitis, however, afterward treated, complete anesthesia of the pulp was obtained with a mixture of adrenalin and cocain.

The author considers that counter-indications against the employment of this method —the use of which he proposes to make general—are but few. They are such as apply to cocain in general, and are of course lessened when weak doses are employed.

In cases of gingivo-periostitis, cocain injection will render but little service; this matters little, however, as treatment of the tooth in such cases is seldom painful. Adrenalin, modifying the circulation of the inflamed tissues, would assist the action of cocain; hence the good results obtained in cases of acute pulpitis. On the other hand, it would be useless to have recourse to cocain anesthesia in the treatment of caries of the fourth degree. The tooth being dead, its treatment would be painless even without an anesthetic.

He sums up the advantages to be obtained from gingival cocain injections in painful dental operations as follows:

CONCLUSIONS.

(a) It always suppresses pain, often as intense as that produced by the extraction of a tooth, and certainly for a longer period than is required for an extraction.

(b) In caries of the second degree the pain otherwise experienced in the preparation is avoided. The means ordinarily applied to obtain insensibility of the dentin have but little efficacy. The treatment, under cocain anesthesia, is rendered more rapid, as it requires but one sitting to accomplish what could otherwise have been done—and that less perfectly—only in several treatments. Cocain anesthesia permits the painless preparation of retention points in the case of a gold filling.

(c) In caries of the third degree, the pulp being anesthetized, one can at once proceed with the treatment. Cauterization is avoided, and the operation is rendered briefer.

The observations tabulated by the author apply to cases of caries of the second and third degrees. Two were deemed to be failures—only relative failures, as the dentin was anesthetized. Attention is called to a case in which an injection of cocain and adrenalin was successful when employed one week after cocain by itself had failed.

The duration of anesthesia was not always recorded in these cases, but it was practically maintained for a longer period than would have been necessary for the performance of the cavity preparation.

M. Touchard has frequently had to treat females of highly nervous temperament where the lesions were very painful; and the results obtained in such cases were all the more satisfactory.

[*British Dental Journal*, London, July 16, 1906.]

HEMOPHILIA. [ABSTRACT.]

Professor Sahli publishes in the *Zeitschrift f. klin. Medizin* some observations on the causes of hemophilia, made in four cases of bleeders recently under his care. He altogether rejects the old idea of easily lacerable vessels, and the hypertrophy of the left ventricle so often found. In his cases he found that hypertrophy did not increase the blood pressure. The examination of the morphological constituents of hemophilic blood only showed small deviations from normal; leucocytes normal or somewhat decreased, polynuclear lymphocytes somewhat decreased, mononuclear somewhat increased, and also, in one case, the eosinophil cells; the total blood-count did not differ from the normal.

In addition to this, the amount of water contained, the osmotic pressure, and the degree of alkalinity were in each case found to be approximately equal to normal. The amount of fibrin contained was within the limits of health.

Some interesting experiments were made as to the time required for coagulation. Under ordinary conditions, hemophilic blood required double the time, or even more than that, for coagulation than does healthy blood. When, however, the subject had been bleeding for some time, ten minutes or so, his blood coagulated very quickly—in one minute, while that of a healthy man under the same conditions required several. The difference was most marked when the blood was removed from the site of the hemorrhage. Hemophilic blood, under these conditions, was found to possess the power of making normal blood coagulate more quickly when added thereto.

It was noted that, as in normal subjects, the coagulative power increased as bleeding went on; in bleeders this took place in an increased degree, but was still not sufficient to bring the bleeding effectually to an end. In one of his cases, Sahli found that the bleeding, after proceeding freely for some minutes, could be stopped by means of a simple suturing of the wound.

He found also that the addition of defibrinated normal blood brought about much quicker coagulation in hemophilic blood, and moreover, that the amount required to produce this effect was very small, suggesting a sort of fermentation. On the ground of this and several other considerations, he formed the opinion that the blood of bleeders is lacking in "thrombo-kinase,"or zymoplastic substance, or else that this is secreted in too small an amount and too slowly from the injured walls of the vessels and the blood-cells. Local attacks, such as the propensity to hemorrhage into the joints, bleeding from the kidney, etc., he attributes to local deficiencies in the walls of the bloodvessels.

The advice he gives about treatment is quite uninfluenced by the above researches and results, for he warns expressly against the injection of zymoplastic substances into the bloodvessels. He considers the best and only means for lessening the tendency to bleeding is plenty of mixed diet and bodily exercise. For injuries he recommends a 2 per cent. gelatin dressing or a ½ per cent. solution of calcium chlorid, but he sets his hopes upon the local use of adrenalin. He condemns the use of iron perchlorid and injections of ergotin.

[*British Journal of Dental Science*, London, August 1, 1906.]

WHY NEGROES HAVE SUCH WHITE TEETH. [ABSTRACT.]

It is a commonly known fact that negroes are but slightly liable to caries of the teeth. M. Charézieux, during a sojourn in the Soudan, and principally at Timbuctoo, during 1902 and 1903, made efforts to find scientific justification for this popular impression by observing several black races, and comparing the results afterward with representatives of aboriginal white races: Tuariks, Moors, and Arabs. In a note published recently he declares that the immunity from caries attributed to negroes is not so complete as is thought; but, on the other hand, he calls attention to the remarkable whiteness of their teeth, which, it appears, is adequately explained by the special buccal hygiene which they observe.

The truth is that while the contrast between the different tints of the teeth and the color of the skin has something to do with this superficial impression, M. Charézieux noticed that at the back of the mouth the teeth were frequently covered with tartar, with caries of various degrees, and sometimes with the gums separated from the teeth as in expulsive gingivitis. These lesions did not attack a few isolated persons only, but a very large proportion, 60 per cent., of the subjects examined. Hence the negroes of the Soudan have by no means that complete immunity which is attributed to them.

Endeavoring to find out the causes of soundness or decay of the teeth among the natives, M. Charézieux examined first the chemical reaction of the mouth itself and then the local hygiene of the mouth. So far as the saliva is concerned, he found that the reaction was always acid, either slightly so or decidedly, but never alkaline, and without there being any relation between this acidity and the progress or the gravity of the caries. Persons with superb teeth showed very acid chemical reaction of the mouth, while others badly affected had only a very slightly acid mouth. This constant acidity appears to be provoked by the continual chewing of the kola nut, which is very rich in tannic acid. And in those cases in which buccal acidity does not exercise any influence on the brightness of the teeth it is necessary to attach real value to the care which is taken to preserve this brightness.

Those who have lived among negroes know that both men and women rub their teeth with a piece of soft wood. For this purpose they take a little twig of this wood, make several splits in one of its extremities, or simply bite it a little; then, holding it by the other extremity, they rub their teeth with it. The front teeth, being the most accessible, are consequently the best and the most frequently rubbed, and these teeth are almost always preserved from caries. Whenever the negro does not smoke or does not chew kola nuts, he rubs his teeth in this way, and this occupation becomes a kind of attitude of deportment, as is smoking a cigarette for certain smokers in European countries; and the women of the country, coquettish like women in every latitude, do not neglect—far from it—this dental toilet, which has the advantage of not causing the wear and tear attributed to the excessive use of our powders and brushes.

In addition to his mechanical attention, M. Charézieux attaches importance to the rôle played by their system of alimentation and to the quality of their drinking-water in causing the good condition of the teeth of the Soudan negroes. The food of the natives is almost exclusively vegetarian. Rice and millet are the basis of their diet; meat is eaten only exceptionally. Thus buccal fermentation is reduced to its minimum; the decomposition of animal food residuum is either *nil* or insignificant. Those are conditions favorable to the preservation of the teeth which it becomes important to point out. So far as concerns the quality of the drinking-water, it had often been incriminated as a cause of caries co-existing with a delay in dental development by reason of its poverty in calcareous salts. Without having made an analysis of the water drunk in the neighborhood of Timbuctoo, M. Charézieux noticed that the well-water is strongly charged with magnesium salts, to such an extent as to be disagreeable in taste to strangers.

Thus, hygienic habits, the nature of their alimentation, and the quality of the drinking-water, are the three factors to which the negroes of the Niger district owe the fine appearance of their teeth. Ethnic influences have nothing to do with the matter, for some whites, the Berbers, who belong to quite a different race, but live the same kind of life—that is to say, eat in the same way, drink the same water, and practice the same local and buccal hygiene—have teeth as handsome, and present the same relatively small proportion of caries of the teeth, as the negroes themselves.

[*Revue Odontologique*, Paris, July 1906.]

ETIOLOGY OF NOMA. BY MONS. HERMANN.

From his researches M. Hermann (*Presse Médicale*) concludes that the principal etiological agent of noma is the spirocheta of necrosis, corresponding to the streptothrix of Schiffert-Perthes. This micro-organism is identical with the one described by Plauts Vincent and others in ulcero-membranous lesions of the mouth, and which normally exists in the mouth, though in small numbers. The two pathological conditions which we meet are the result of the activity not of two different micro-organisms, but of two successive stages of the same microbe. This organism is not a bacillus, but forms part of a group intermediate between the bacteria and protozoa, viz, the spirochetæ; this explains the impossibility of cultivating them in the usual media. These spirochetæ probably exist in the atmosphere in the state of resisting spores; when deposited on food they may be introduced into the human organism, but in order to bring about their development a concurrence of particular conditions is requisite; further, noma is found to be but slightly contagious.

From the unity of the pathogenic agent is deduced the unity of the malady: gangrenous stomatitis is but an advanced stage of ulcerous stomatitis. The latter is occasionally caused by a bad condition of the teeth, the micro-organism developing easily between the gum and the diseased tooth. On the other hand, the tooth, by its constant pressing on the tongue, occasions a superficial lesion which constitutes the beginning of the ulceration.

The best treatment is to cauterize the ulcer by means of the thermo-cautery; cauterizing as well the apparently healthy underlying parts, for these are already invaded by the micro-organism.

A gangrenous process, such as characterizes noma, can manifest itself in other parts of the body.

[*British Dental Journal*, London, July 1906.]

A PLEA FOR ANTISEPTIC MOUTH-WASHES. BY STANLEY P. MUMMERY, M.R.C.S., L.R.C.P., L.D.S., ENG.

In this article the author combats the position taken by Dr. J. Sim Wallace in his series of articles on the etiology of caries which have lately been appearing in the *British Dental Journal*, in which he deprecates the use of antiseptic mouth-washes on the ground that they destroy the normal flora of the mouth, which flora is beneficial to the individual. There are, as we know, a large number of micro-organisms which flourish in every healthy mouth—sometimes called the "normal mouth-bacteria." The writer calls attention to a paper read before the Odontological Society of Great Britain in March 1904 by Professor Miller, in which the results of experiments showed that the destructive or pathogenic micro-organisms which have gained access to the mouth are affected, not by any antiseptic properties of the saliva, but by the law of "the survival of the fittest," the strangers failing in the struggle for existence with the more numerous and better established organisms present. Dr. Hugenschmidt had previously come to the same conclusion in Paris. The author presumes that it is on these grounds that Dr. Sim Wallace decries the use of bactericidal mouth-washes.

In opposition to this view, the writer calls attention to the fact that the pathogenic germs of many dangerous diseases—for example, tuberculosis, pneumonia, and diphtheria—gain entrance to the body by way of the mouth, and contends that it is a safer practice to regularly rinse the mouth with antiseptic washes, thus killing all, harmful and harmless alike, than it is to trust that by the law of "the survival of the fittest" the harmful germs will perish before producing disease; and he asks further, "Is it so certain that all of these organisms constantly present in the mouth are perfectly harmless on all occasions?"

Another point we have to consider is that to enable the normal mouth-bacteria to exercise the selective functions a perfectly healthy mouth is necessary; *i.e.* a mouth without unfilled teeth, discharging stumps, or unhealthy conditions of the mucous membranes. It is certainly no exaggeration to say that eighty per cent. of mouths are unhealthy, and until the general public have been educated to a higher standard of oral cleanliness, and have learned the importance of keeping their mouths clean, it seems a premature step to abolish mouth-washes for the reason that they upset the balance of the natural flora of the mouth, when this balance only obtains in about twenty per cent. of individuals.

In this connection the writer thinks that Dr. Wallace's attempt to relegate the toothbrush to a place of very secondary importance, or even to abolish it, as he seems inclined to do, is more especially unfortunate. One cannot help feeling great surprise at finding a dentist in these days making the statement that "cleaned teeth are most susceptible to decay."

In the *British Dental Journal* for January 15, 1906, Dr. Sim Wallace makes the following remark: "Lastly, what would we think if, as the result of elaborate irrelevance and multitudinous experiment, we learned from this disquisition that in order to prevent indigestion we should as a routine procedure rinse out our stomachs morning and evening with antiseptic washes. . . .?" The author in commenting on the foregoing says, "I should like to point out to Dr. Wallace that not only is the stomach a sterile cavity—whereas the mouth, even by his showing, is never sterile—but that this sterility is the actual result of the antiseptic properties of the gastric juice, which, by killing organisms which gain access to it, forms a most efficient protection to our bodies against disease. So that to all intents our stomachs *are continually rinsed by an antiseptic wash,* and that one provided by nature. Unfortunately, our mouths do not possess a similar natural antiseptic; if they did, we should no longer harbor pathogenic germs in our throats, ready at any time to take advantage of a temporary lowering of our physiological resistance to set up serious if not fatal diseases. Among wild animals, and even truly barbaric man living in a natural state, the provisions of nature against the invasions of disease are probably efficient, but in the highly artificial state in which we now live, nature has not had time or opportunity to adapt our bodies to the changed conditions, and we can only hope to remain healthy if we aid her by keeping our bodies free from disease by artificial means."

We have to face the fact that the food of modern civilized man is on the whole distinctly detrimental to the teeth, and with this obvious fact before us, it is surely the duty of every dentist to do all in his power to teach the public the only sure and certain preventive of dental disease, namely, constant and thorough cleansing of the mouth and teeth by means of the tooth-brush and mouth-washes.

Here we have a simple and, if properly carried out, certain means of combating this evil product of civilization, and we shall be more likely to immediately benefit humanity by teaching this simple measure than by attempting the herculean task of revolutionizing modern dietetics.

PERISCOPE.

How to Apply Topical Remedies.—In applying topical remedies to sensitive cavities, care should be taken to have them heated sufficiently to prevent any shock or pain.—W. G. E., *Dentist's Magazine.*

Antidote for Silver Nitrate.—The use of a solution of sodium chlorid, after the application of silver nitrate to any of the mucous membranes, will do away with the great discomfort to the patient resulting from the application of this drug.—WALTER GRIESS, *Therapeutic Gazette.*

To Clean Wax.—After melting and straining the wax, boil it for twenty minutes in a solution of half-ounce oxalic acid to each quart of water. Old wax may be made cleaner than new. Two drops of oil of cassia added to each pound keeps wax aseptic, and renders it less unpleasant to the patient.—THOS. FLETCHER, *Pacific Med. Journal.*

Supporting a Sore Tooth while Drilling.—Instead of supporting a sore tooth by ligature to prevent pain while it is being drilled, take modeling compound, soften it and make a splint for both lingual and buccal sides of the tooth to support it. This will prevent jarring, and also prevent pressure on the inflamed peridental membrane.—T. L. GILMER, *Amer. Dental Journal.*

Successful Treatment of Sensitive Cavities.—Previous to excavating sensitive cavities, I have found an application of the following solution very effective: Zinc iodid crystals, 1½ gr.; iodid crystals, 2 gr. Make a solution of this in glycerin. Wind a small pellet of cotton on the end of a broach, dip it in the solution and apply it to the decay. For removing the stain use hydrogen dioxid.—E. M. S. FERNANDEZ, *Dental Review.*

Preserve Your Models.—Orthodontia models should be as perfect as possible, should be built up smooth and level, and be trimmed in a uniform manner and to a uniform height. They should then be preserved from dust, and handled as little as possible. As the collection grows it becomes valuable, both as a record of work done and for comparative study in new cases. It also becomes impressive to patrons, and helps wonderfully in securing proper fees in cases. Contrast this with the usual spectacle of a lot of old dusty models, laid away on a shelf or thrown in some drawer, with teeth broken off, and neither built up nor trimmed. Such models show but little in the first place, and create a distinctly unfavorable impression whenever shown, hindering rather than helping to secure a proper fee.—*Western Dental Journal.*

Extracting when the Hypodermic Needle is Employed.—Three fundamental rules which must be followed in order to insure the desired results: First, render the area of tissue to be injected aseptic; second, positively sterilize your needle before injecting, and third, remove all deposits about the tooth involved, otherwise infectious calculus will be crushed into the tissues by the beaks of the forceps during the process of extraction.—L. O. GREEN, *Dental Brief.*

Perfectly Swaged Cusps.—After a piece of gold has been swaged into the lead counter-die, remove and anneal it and place it back in the counter-die, with a piece of rubber dam doubled between the lead counter and the gold. Place the die in position and strike hard. The cusps will be found very sharp and close-fitting. Take care not to get the rubber between the gold and the die instead of between the gold and the lead counter-die.—J. S., *Pacific Dental Gazette.*

Behavior of Cement under Different Climatic Conditions.—Climatic or atmospheric conditions so alter the behavior of a given cement combination that these must be taken into consideration. Working in a crowded clinic room, for instance, in midwinter, one will have an experience with cement very different than in using the same cement in his private surgery the previous or following day, all because of the humidity of the atmosphere. There are combinations suited to hot, humid atmospheres and to dry, cool atmospheres. I cannot consistently give definite examples of cements for special purposes, but the selection is easy, since the cement for a tropical atmosphere must be slow of setting, while in a cool, dry atmosphere such a one would prove unsatisfactory. I ventured the statement a dozen years since, that far better cement work can be done in midwinter than in midsummer, and for the same reasons better cement work can be done in dry, temperate climates than in equatorial regions, which might be illustrated by the sea-coast and elevated interior of Mexico. The fact is often cited that natives of northern Europe are seen in this country with exceptional cement fillings. This can easily be attributed to favorable climatic conditions, and to the fact that the main training of dentists in those countries is in the use of plastics. I am not willing to admit that better materials are used in those countries than in the United States.—W. V-B. AMES, *Dental Summary.*

Etching vs. Grooving.—It has been demonstrated time and again that cement will not adhere to a glazed surface as well as to an etched one. I have found from experience that in all cases where an inlay has dropped out of a cavity you will find that the cement adhered to the surface of the tooth, and not to the inlay itself. I do not attempt to groove my inlays any more on account of the danger of serious damage, and I find it not necessary.—J. E. NYMAN, *Dental Summary.*

Flux for Soft Soldering.—Pieces of zinc are dissolved in hydrochloric acid until the acid is saturated. The resultant solution of zinc chlorid is mixed with an equal amount of a mixture consisting of aqua ammonia and alcohol. After standing a few days the solution is filtered and ready for use. The so-called Miller's soldering fluid consists of a solution of phosphoric acid in eight parts of water, to which one part each of lactic acid and glycerin has been added.—*Dental Era.*

Controlling Alveolar Hemorrhage.—Soften gutta-percha and press it into the alveolar socket, with a considerable excess. Have the patient bite into it to occlusion, and force the excess against the buccal and lingual surfaces. Take it out, cool and trim away such portions as are not needed, and make the plug smooth. Then replace it, and let the patient hold it in position by closing the teeth. It makes an effective mechanical plug, which may be of use in retaining medicinal agents.—E. A. BOGUE, *Dental Register.*

Cement Fillings should Overlap Cavity Margins.—I have always been very particular to finish a metal filling perfect with the contour of the tooth. With cement fillings I pursue the very opposite method. I desire the filling to lap over the entire margin of the cavity. This method has given very gratifying results. By this method, I have found that disintegration near the gingival border of the cavity, on account of chemical decomposition, is less evident than reduction of size on account of attrition. Such disintegration near the gingival border of the cavity was a source of aggravation a number of years ago. Once upon a time I conceived the idea of permitting my cement fillings to overlap and remain so, and the result was very satisfactory. Another source of satisfaction I had was that the protruding and overlapping filling was never productive of irritation or inflammation of the gums.—D. M. OLNECHT, *Dental Summary.*

Impression Material for Cases in which All the Teeth are Present.—In regulating cases, where all the natural teeth are present, plaster is the material *par excellence* to be used, and a deep tray. It is necessary not only to secure a cast of the teeth and palate, but the buccal surface of the teeth, the gums, and especially the direction of the roots. For study casts this is important, and no impression material is so reliable for this work as plaster of Paris.—E. M. KETTIG, *Dentist's Magazine.*

Cracks in the Enamel due to Expansion of Metallic Fillings.—After inserting, as we thought, a perfect gold filling, a suspicious-looking crack may suddenly appear in the enamel. This is due to the expansion of the gold in response to the heat engendered in polishing the filling; in other words, the expanding plug of gold has burst the unyielding walls of the cavity, and so surely as the gold will contract again on cooling, so surely must it leave a space between itself and the walls of the cavity.—*Dental Summary.*

Value of the Mouth-mirror.—The constant use of the mouth-mirror should be drilled thoroughly into every dental student. By its use lingual cavities in the upper incisors and canines and all cavities in the upper bicuspids and molars may be filled with far greater ease than by direct vision, and filled better, for the mirror gives a view of every part of the cavity, and in addition serves as a reflector to furnish additional light. It is of great assistance also in working upon the lower teeth, serving as a tongue-guard as well as a reflector. In addition to all this it allows the operator to stand erect, as God intended he should, and he is thus enabled to fill his lungs with life-giving oxygen instead of a mixture of carbolic acid and various noxious gases and germs from his patient's breath—and incidentally the patient is spared the dentist's breath, which is not always to be compared with the attar of roses. How much more comfortable it must be for the patient, when the operator stands erect and fills, for instance, a distal cavity in the upper bicuspid by aid of the mouth-mirror, instead of spreading himself all over the patient's person in an effort to see what he is doing. The mouth-mirror should be the first instrument picked up when beginning to operate, and in nine cases out of ten, should not be laid down during the operation.—J. W. O'BRYON, *Western Dental Journal.*

A Point in the Retention of Lower Dentures.—About five years ago a lady called at my office to have me construct for her a lower denture. Upon examination, I found that the alveolus from the region of the first bicuspid on either side was almost completely obliterated, and in the region of the anterior teeth there was a flat ridge, rising about one-fourth of an inch above the attachment of the buccal and lingual muscles.

I took great pains in constructing the denture after the ordinary method, paying particular attention to the articulation, and making the teeth a little shorter than they really should have been for appearance sake, to reduce the leverage as much as possible, and sent my patient home with instructions to exercise patience and perseverance for about two weeks, and if she were not getting satisfaction to return. I might say that I really expected her to return. When she did return, she complained of the denture sliding from one side of the mouth to the other.

I again examined the mouth, and thought that it might be possible to extend the inner flange of the denture back inside the ramus to near the anterior pillar of the fauces. I then took an ordinary impression tray and some wax, and made the extensions on the tray. I took the impression, and to my satisfaction found that I had a splendid impression of the process and the inner part of the ramus, and that the patient experienced no more unpleasantness than in the ordinary way. I constructed the denture from this impression, and found that the patient could wear it with much comfort. Consequently, I have been using this method ever since when I met a case with a poor process.

I might say that I have noticed that where the alveolus is badly absorbed, it is much easier to get an impression of the inner part of the ramus. This method not only prevents the denture from moving from side to side, but it also prevents a backward motion; in fact, it places the denture, as it were, within a dovetail space.

Having constructed a denture after this manner, it is still all-important to see that the articulation is perfect; because a lower denture has not so much retention, even with this method, as has an upper. Therefore it is always the weakest, and will be the first to move.—A. T. MORROW, *Dominion Dental Journal.*

Bad Teeth Cause Rejection of Many Army Recruits.—During 1904, of over 244,425 European officers and men of the British army serving at home and abroad, more than half (159,644) were admitted to the hospital, 1592 died, and 4778 were discharged from the service on account of disease and injuries. The respective rates were considerably below those of the previous year and also of the average rates for the ten years 1894–1903. The decrease, a blue-book just issued states, was noticeable in all arms of the service. It is curious to note the following variations: The highest rate of admission to hospitals was in the Foot Guards (768 per 1000), the Household Cavalry coming next; the mortality was highest in the regimental depots (52 per 1000), and lowest in the Household Cavalry and Foot Guards; the invaliding rate was highest in the Infantry (33.62 per 1000), the Foot Guards coming next; and constant inefficiency was highest in the latter (58.92 per 1000), the Cavalry coming next.

Great attention is of course paid to the soldiers' teeth; 6214 men had their teeth filled or otherwise treated, while 4740 men had 7604 teeth drawn; of that number 456 were extracted under anesthetics.

During the year 70,346 recruits were inspected, and 23,790, or one-third of the number, were rejected as unfit. Compared with the previous year, the ratio of rejection increased by 1.5 per cent. The ratio was highest in the recruits from England and Wales, and lowest in those from Ireland; it was, however, much lower still in recruits from the colonies. About 5000 were rejected for loss or decay of teeth, 3600 for being under the chest measurement, and 2500 for defective vision.—*Dental Surgeon.*

Preparation of the Mouth for an Impression.—Among the first points to be decided, if the mouth be not edentulous, is which teeth, if any, shall be extracted. It is quite generally agreed among authorities on this subject that in the lower jaw no tooth should be removed which can be rendered firm and comfortable. Even a single tooth, when properly clasped, is of great assistance in the support of a lower denture. Teeth which are to be clasped will last longer and give better service if protected by shell crowns. Such crowns should, of course, be fitted before the impression is taken. Any teeth or roots so badly broken down or diseased that they cannot be made comfortable and serviceable should be extracted. In the upper jaw, different conditions prevail. Clasps are not as serviceable as in the lower, and it is good practice to extract certain teeth in the upper, when the corresponding teeth in the lower would be carefully preserved.

After consultation with a number of successful prosthodontists, and a review of his own clinical experience, the writer has formulated the following general rules for extraction as a preparation for impression in the upper jaw:

(a) If not more than three scattered teeth remain, extract them.

(b) If two molars or bicuspids remain on each side, do not extract.

(c) If only the incisors remain, extract.

(d) If four or five teeth remain on one side of the jaw and none on the opposite side, extract.

It will be understood that in a set of general rules exceptions will sometimes be necessary; for instance, if an unusually firm molar or bicuspid remained on each side of the jaw, it might be advisable in some instances to let them remain. If it be feared that the removal of the canines will cause too great a change of facial expression, it is better to cut the crowns off at the gum line and make the plate over the roots, than to attempt to fit around them. In case of four or five teeth remaining on one side, a plate might be made, in some cases, that would serve esthetic purposes, though it would be useless in mastication. To put it in broad general terms, when the remaining teeth in the upper jaw are too few and too weak to support bridge work, they are also too few and too weak to be of material assistance in supporting a plate. They are only retained for a short time at the most, and both patient and operator are better satisfied when a full upper plate is fitted.—F. G. WORTHLEY, *Western Dental Journal.*

The Utility of Porcelain in Large Cavities.—When the larger part of the making of a porcelain filling became a laboratory procedure, by the taking of an impression and working from that, I made use of the porcelain inlay in teeth which were beyond even the application of a full gold crown. I refer especially to those almost hopeless cases of molars in which the buccal half or more is entirely gone, and the cavity has extended under the gum margin. The third molar is frequently found in this condition. It often presents with a cavity of such proportions that it would seem that filling by other methods or an attempt at crowning would not repay the effort. Here it is that the porcelain filling finds a useful place, and in extremely large cavities the aim should be to save the tooth from subsequent decay, and not so much the restoration of the full contour; for the frailty of the supporting tooth-substance will not permit of extensive contour. However, many of the upper third molars are so far out of line buccally, that very little masticatory function is borne by them, and here a fuller contour is permissible. But very little retentive shape is found here, and as a rule, fortunately not much is required. The anchorage will often be sufficient when the decay has been removed. The large buccal cavities of the first and second molars, when treated in this manner, are always very satisfactory; but here the contour must not be carried out to the full extent except where it approximates a neighboring tooth, where the contour must be full for the protection of the gum in approximal spaces.

The method is as follows: The roots having been treated—for nearly all these cases are pulpless—the cavity is packed tightly with a gutta-percha dressing in such a manner as to force the gum out of the cavity. At the next sitting the margins can be seen, and the cavity is prepared for the filling. The most important step is the taking of an impression of the cavity. In this case the material should not be cement, but one which is placed by force. For this purpose I prefer a stick of new modeling compound or dental lac about the size and shape of a small pecan, but a little more pointed at one end. This is warmed at the smaller end so as to soften it for about an eighth of an inch, and while in this condition forced into the cavity. It will be found that if the manipulation has been correct, the soft point has been spread out in every direction in the cavity, and the hard center, following it up, has forced the material into every irregularity, and pushing the gum away, has taken a clear-cut impression of the cavity and its margins. A cement model is now made of the cavity, and by means of any small swaging device the matrix is struck up, and the filling completed.

After taking the impression, it will be seen that this is largely a laboratory procedure, and one which, with the modern appliances, can be relegated with perfect assurance to an assistant. It is a very difficult matter to secure a good matrix from the cavity itself, but by the impression method it is quite easy, and the results are most satisfactory. A filling made in this manner will possess a much better margin under the gum than can be made with any metal or cement filling, and in a manner almost painless to the patient. While the details just described meet this class of cases in my hands, they will admit of some variation to suit each one's methods; but the essential thing is the use of a soft and yet stiffly backed impression material, in order that the gum can be forced well back of the cavity margin, and all the details and irregularities shown.—L. E. CUSTER, *Dental Summary.*

Crowns, Banded and Unbanded.—Much is being said lately against crowns with bands for anterior teeth, and many are arriving at the conclusion that bands are insanitary; but they never say anything against posterior gold crowns, which necessarily encircle the root at the gingival margin and pass underneath the free margin of the gum. If the band has been well fitted, we rarely find an unhealthy condition existing around the posterior gold crown, yet the principle is the same as that of a banded anterior root. Where we find the gums unhealthy around the anterior roots that have been banded, the reason is found in the fact that the roots of those teeth are more difficult to fit than those of the posterior teeth, and the latter will tolerate a misfit better than the former. The fault does not lie with the bands, but with the imperfect fitting, and the careless preparation of the root.

I deem it unnecessary, however, to use bands when crowning single teeth. The bands will not prevent a root from splitting, and a perfect joint may be made between the crown and root as follows: After the root has been prepared, and the crown ground to fit as well as possible, soften a piece of gutta-percha stopping, place over the end of the crown, with pin in position, and press firmly to place on the root. When the stopping is hard, remove the crown and carefully trim the excess gutta-percha even with the outside circumference of the crown. Plate gutta-percha should not be used, as it drags. The crown is now cemented to place, and it will be found that the cement will be a long time dissolving out. This makes a beautiful, natural-looking crown.

I will say concerning the crowns now on the market that most of them will give satisfaction, if discrimination against certain pins or pivots be made in certain cases. Where there is to be much strain upon the pin, as where we find a long overbite, the pure platinum pin should not be used.—W. H. Reaben, *Dental Review*.

Treatment of Alveolar Abscess with Fistula.—If a carious cavity exist in the affected tooth, the first step in the treatment is the thorough cleansing and disinfection of such cavity. Every particle of carious dentin should be removed, and the cavity flooded with a good germicide. The rubber dam adjusted, the pulp-chamber and canal should be carefully cleaned mechanically. That is, with proper pulp-canal cleansers all foreign matter possible should be removed. It is, of course, impossible to clean a canal with instruments, but it is excellent practice to remove all material possible in that manner. The next step is to disinfect as thoroughly as possible the canal and dentinal tubuli. For this purpose there is nothing better than nascent oxygen: Work into the canal with a broach a small quantity of sodium dioxid; add to this a drop of a ten per cent. solution of hydrochloric acid; when effervescence ceases, wipe out with cotton and repeat the treatment. If this is kept up for twenty or thirty minutes there is reasonable certainty that the canal is clean. The sodium dioxid, as it is caustic, should only be used under the rubber dam. For the next step in the treatment take a quantity of hydrogen dioxid in a hypodermic syringe, pass the needle up the canal as far as it will go without forcing, pack a little unvulcanized red rubber around the needle, and force the dioxid through the tooth until it appears at the opening on the gum. This should be repeated until the dioxid runs through clear, without effervescence. Next take a wisp of cotton large enough to loosely fill the canal, dip it in pure carbolic acid, and place it in the canal. Over this place a piece of unvulcanized rubber, and with a large ball burnisher put pressure on the rubber until the carbolic acid is forced through the fistula. This will be shown by the gum turning white at the opening. Just a little practice will enable anyone to force medicaments through a tooth and fistula in this manner.

A drop of thin chloro-percha is now placed in the pulp-chamber, and with a smooth broach pumped into the canal. It is essential that the solution is not of a creamy or ropy consistence, but so thin as to flow readily. Place a pledget of the unvulcanized rubber over this, and by pressure force the chloro-percha through the apical foramen, and if possible out at the fistulous opening on the gum. The canal may then be filled with gutta-percha points, and the case dismissed. Any case which can be cured at all by treatment through the root-canal will be cured by this one treatment, if carefully followed out. Coagulable lymph is poured out around the gutta-percha in the broken-down area, and not becoming infected through the tooth, is promptly organized into repair tissue. In from three to seven days it may be considered well. To give a case of this character a thorough treatment, and after the lapse of two or three days again force a medicament through the tooth and tract, merely delays the cure by breaking down the newly-formed granulation tissue with which nature is trying to repair the injury. As long as the canal remains unfilled, it is a possible source of reinfection, unless extraordinary precautions are observed. A complication may exist which will prevent the healing of a case after this treatment is given. If resorption of the root-end has taken place, if serumal deposits have been made on the denuded root, or if necrosed or carious bone be present, the case will not heal. With either of these complications any treatment through the root-canal must prove a failure. The irritant must be removed by operation from without. In any case, the immediate filling of the canal removes the cause of the condition and eliminates the most dangerous channel for reinfection.—*Dental Summary.*

OBITUARY.

DR. CHARLES A. FULLER.

Died, at his home in Watertown, New York, March 17, 1906, Dr. Charles A. Fuller, in the fortieth year of his age.

Dr. Fuller was born at Burr's Mills near Watertown, New York, in 1866. He received his early education in the public schools, and then entered a machine shop in Watertown, where he completed his apprenticeship and became an expert mechanic. His interest in the profession of dentistry was derived from his brother, a dental practitioner, and in 1889 he matriculated at the Iowa Dental College, from which institution he was graduated two years later and immediately entered into the practice of his profession in Watertown, where he remained in active service to a large and loyal *clientèle* until three weeks before his death.

His early mechanical training, together with his natural genius, love for accuracy, and the persistence with which he aimed at perfection in all his work, together with his professional training, well fitted him for the practice of dentistry. His prosthetic work, gold operations, and in fact the results of all his manipulative work, were of the highest order of merit, both artistic and from the standpoint of durability. While he excelled in the manipulative features of his professional work, he was well versed in the theory and practice of medicine, and kept himself continually abreast of the latest developments in all that pertained to the scientific aspect of his calling.

Dr. Fuller was a charter member of the Jefferson County Dental Society, in which organization he worked most faithfully, having capably filled in succession the offices of treasurer, secretary, vice-president, and president, besides having acted on numerous committees to the advantage of the association's work, and having presented many valuable papers and clinics. He was also a member of the Fifth District Dental Society of the State of New York, and always conducted his practice on those ethical principles for which those societies stand. He was a member of the Masonic order and of the Odd Fellows, in which organizations he was a stimulus and help.

Plain, conscientious, faithful, sincere, and also an ardent worker, he not only drew around him a large and loyal *clientèle* which he faithfully served, but his many merits as a man and as a dentist earned for him the respect of the community and of all who came in contact with him.

Dr. Fuller married Miss Ida Gregg of Iowa City, Iowa. His wife survives him, with two children, a boy of eight and a girl of five years of age.

Dr. Fuller's death is the first of its membership to be recorded on the books of the Jefferson County Dental Society in the eleven years of its existence. The funeral services were conducted from his home, the Rev. Dr. A. M. Brodie officiating. The Jefferson County Dental Society, the Masonic order, and the Watertown City Lodge of Odd Fellows attended the funeral. Six of his former colleagues acted as pall-bearers, and the services were conducted in comformity with the Masonic rites.

HINTS, QUERIES, AND COMMENTS.

THYMOPHEN.

AN editorial in the *Dental Register* for September 15, 1906, directs attention to an editorial in the *Dental Era* for August, in which Dr. Herman Prinz, the editor, sets forth with much clearness his claim to originality in publishing an account of this valuable combination.

We have much pleasure in awarding to Dr. Prinz all credit which is due in this particular, which we should have cheerfully accorded to him in the publication of the item headed "Thymophen" in the DENTAL COSMOS for July—in which, it will be noticed, no claim is made as to originality—had we known of his original publication in the *Dental Register* of 1900.

From long experience and considerable observation the writer has become convinced that it is quite unusual for any man to originate a suggestion or idea which has not been previously discovered by someone else. The desirable qualities of the combination of thymol and phenol crystals as reported in the July DENTAL COSMOS were discovered during the course of some laboratory experiments, and the findings were briefly reported for the benefit of others, and because of the extreme probability that it had been previously discovered by some other investigator, no claim as to originality was made in the report. It is very gratifying to observe the additional evidences which the report made by Dr. Prinz presents as to the extremely satisfactory character of this medicament.

EDWARD C. KIRK.

Philadelphia.

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SOCIETY NOTES AND ANNOUNCEMENTS.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

AT the annual meeting of the National Association of Dental Examiners the following officers were elected: Geo. E. Mitchell, Haverhill, Mass., president; F. O. Hetrick, Ottawa, Kans., vice-president from the West; F. A. Shotwell, Rogersville, Tenn., vice-president from the South; H. J. McFadden, Philadelphia, vice-president from the East; Chas. A. Meeker, Newark, N. J., secretary and treasurer.

Committee on Colleges—J. G. Reid, Chicago, Ill.; J. J. Wright, Milwaukee, Wis.; J. F. Dowsley, Boston, Mass.

Committee on Joint Conference of the N. A. D. E. and N. A. D. F.—N. A. D. E.: F. O. Hetrick, Ottawa, Kans., chairman; Chas. A. Meeker, Newark, N. J.; J. A. Hall, Collinsville, Ala. N. A. D. F.: M. W. Foster, Baltimore, Md.; M. C. Marshall, St. Louis Mo.; H. E. Friesell, Pittsburg, Pa.

Credentials and Membership Committee—W. G. Mason, Tampa, Fla.; W. G. Rambo, Marietta, Ga.; H. W. Campbell, Suffolk, Va.

State Advisory Committee—C. R. Shacklette, Louisville, Ky.; Brooks Rutledge, Florence, S. C.; T. P. Whitby, Selma, Ala.; H. S. Sutphen, Newark, N. J.; C. H. Oakman, Detroit, Mich.

Committee on Promoting Relations with Foreign Examiners—T. J. Barrett, Worcester, Mass.; J. K. Douglas, Sandusky, Ohio; R. H. Walker, Norfolk, Va.

Committee on Resolutions—H. B. Purl, Kirksville, Mo.; H. G. Brown, Columbus, Ohio; R. H. Walker, Norfolk, Va.

Committee on Tabulation of Examiners' Reports of Examinations—A. Irwin, Camden, N. J.; F. A. Shotwell, Rogersville, Tenn.; C. F. Ladd, Lincoln, Neb.

Committee on Publication—J. E. Chace, Ocala, Fla.; J. K. Douglas, Sandusky, Ohio; E. D. Brower, Lemars, Iowa.

Committee for Promoting a System of Credits and Uniformity of Examinations—T. E. Turner, St. Louis, Mo.; F. R. Henshaw, Middletown, Ind.; J. J. Wright, Madison, Wis.

The first mentioned in each case is the chairman.

CHAS. A. MEEKER, *Sec'y.*

INSTITUTE OF DENTAL PEDAGOGICS.

THE fourteenth annual meeting of the Institute of Dental Pedagogics will be held in Chicago, Ill., December 27, 28, and 29, 1906. The following subjects will be discussed: Teaching of Anesthesia: The Emergencies—How Treated, How Prevented. Teaching of Operative Technique. Teaching of Prosthetic Technique. A Method of Teaching Orthodontia. Teaching Porcelain Technique. Teaching of Materia Medica. Report of Committee on Dental Nomenclature.

W. EARL WILLMOTT, *Sec'y,*
Toronto, Ont.

A CALL FOR AN INTERNATIONAL MASS MEETING OF DENTISTS.

The "Open Letter" in the November journals has brought out responses having one purport, viz, showing a decided interest in the subject of preventive dentistry. From every point of the compass comes the unanimous concurrence in the opinion that it will be wise to issue the call. Therefore all dentists are invited to meet on Monday—the day previous to the annual meeting (January 15, 1907) of the New York Odontological Society at the Hotel Knickerbocker, Thirty-second st. and Broadway, at 9.30 A.M. Please respond in person or by correspondence. Address any of the names in "Open Letter," or

DR. G. ALDEN MILLS,
226 Central Park, West.

P. S. Original articles will be gladly received.

AMERICAN SOCIETY OF ORTHODONTISTS.

THE next meeting of the American Society of Orthodontists will be held in New York city during Christmas week, 1906.

FREDERICK S. MCKAY, *Sec'y,* St. Louis, Mo.

OHIO STATE DENTAL SOCIETY.

THE forty-first annual meeting of the Ohio State Dental Society will be held in Columbus, December 4, 5, and 6, 1906. A program of varied and exceptional interest has been provided, and we hope to surpass the very successful meetings of recent years. The papers are of the best, the clinics numerous and instructive, and the exhibits extensive and complete.

The membership of this society has nearly doubled in the last three years. If you are not a member, and are eligible, come and join; but come!

F. R. CHAPMAN, *Sec'y,*
Columbus, Ohio.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE semi-annual meeting of the New Hampshire Board of Registration in Dentistry for the examination of candidates will be held at Masonic Banquet Hall, Manchester, N. H., December 11, 12, and 13, 1906.

A. J. SAWYER, *Sec'y,*
Manchester, N. H.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS.

THE next examination of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, South Dakota, January 29, 30, and 31, 1907, beginning at 1.30 P.M. All candidates for examination must bring diplomas from reputable dental colleges or affidavit of having been engaged in the practice of dentistry for at least three years immediately preceding said examination. Instruments and materials necessary to do all kinds of operative and prosthetic work will be needed at this examination. Vulcanizer and lathes will be furnished by the board. All applications must positively be in the hands of the secretary by January 22d.

G. W. Collins, *Sec'y,*
Vermillion, S. D.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

The Board of Dental Examiners of Pennsylvania will conduct examinations in Harrisburg, Pa., December 11 to 14, 1906.

For papers and particulars address the secretary of the Dental Council,

N. C. Schaeffer, Harrisburg, Pa.

IDAHO BOARD OF DENTAL EXAMINERS.

The Idaho Board of Dental Examiners meets in Boisé City, December 27, 28, and 29, 1906, for the purpose of examining applicants for license to practice dentistry in Idaho.

C. E. M. Loux, *Sec'y,*
Pocatello, Idaho.

INDIANA BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Indiana State Board of Dental Examiners will be held in rooms 11 and 12, State-house, Indianapolis, January 8 to 11, 1907. All applicants for registration will be examined at this time. For further information, blanks, etc., apply to

F. R. Henshaw, *Sec'y,*
Middletown, Indiana.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS.

The Board of Dental Examiners of the District of Columbia will conduct the semi-annual examination at the Dental Department of Georgetown University, Wednesday, Thursday, and Friday, January 2, 3, and 4, 1907. All applications must be accompanied with a fee of ten dollars. For further information address

William B. Daly, *Sec'y,*
1311 R. Island ave., N. W., Washington, D. C.

KENTUCKY BOARD OF DENTAL EXAMINERS.

The Kentucky State Board of Dental Examiners will hold their next meeting for the examination of applicants the first Tuesday in December. Every applicant must be a graduate of a reputable dental college. For further information address the president of the board.

J. Richard Wallace,
The Masonic, Louisville, Ky.

IOWA BOARD OF DENTAL EXAMINERS.

The Iowa State Board of Dental Examiners will hold their next meeting for examination at Iowa City, February 6, 7, 8, and 9, 1907. Candidates will be furnished with proper blanks and such other information as is necessary upon application to the secretary. All applications must be filed with the secretary five days prior to the date of examination.

Address all communications to

E. D. Brower, *Sec'y,* Le Mars, Iowa.

NEW JERSEY BOARD OF REGISTRATION.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual meeting in the State-house, at Trenton, N. J., beginning Monday, December 10, 1906, at 9 A.M., and continuing through the 11th, 12th, and 13th. Practical and theoretical work completed at this place.

All applications must be in the hands of the secretary ten days prior to the meeting.

For further information apply to

Charles A. Meeker, *Sec'y,*
29 Fulton st., Newark, N. J.

BANQUET TO DR. G. V. BLACK.

The Fraternal Dental Society and the St. Louis Society of Dental Science will unite in giving a banquet in honor of Dr. G. V. Black. at the Jefferson Hotel, St. Louis, Mo., on the evening of January 15, 1907. The afternoon of the same day Dr. Black will deliver an illustrated lecture on some phases of operative dentistry.

The long and untiring efforts and valuable scientific contributions of Dr. Black easily make him the foremost dental scientist the world has ever produced. No dentist, living or dead, so much deserves the thanks and praise of his professional associates. A most cordial invitation is extended to the members of the profession to be present at both lecture and banquet, and to assist in honoring Dr. Black. Those desiring reserved covers for banquet will remit $5.00, the price per plate, to Dr. Richard Summa, secretary, Oriel bldg., St. Louis, before January 12th.

Committee—Geo. A. Bowman (chairman), A. H. Fuller, Edward H. Angle, D. O. M. LeCron, Adam Flickinger, Wm. Conrad, Burton Lee Thorpe.

Geo. A. Bowman, *Chairman.*

G. V. BLACK DENTAL CLUB OF ST. PAUL.

The members and friends of the G. V. Black Dental Club of St. Paul (Inc.) will hold their annual midwinter clinic in February 1907.

Last year we held the largest, best, and most enthusiastic meeting ever held in the Northwest.

The program and dates on which the meeting will be held will shortly be published.

Members of the dental profession in the United States and Canada cordially invited to attend our clinic.

Special rates on all railroads. For any further information apply to

R. B. Wilson, *Sec'y,*
107 E. Sixth st., St. Paul, Minnesota.

ALUMNI ASSOCIATION OF CHICAGO COLLEGE OF DENTAL SURGERY.

Twenty-fifth Anniversary Reunion.

On January 16 and 17, 1907, the Alumni Association of the Chicago College of Dental Surgery will celebrate the twenty-fifth anniversary of the establishment of the college by holding a grand reunion and clinic. Arrangements have been made for a number of papers, a very extensive clinic, a theater party, and a banquet. A railroad rate of a fare and a third for the round trip from all points in the United States and Canada on the certificate plan has been arranged for.

A cordial invitation is extended to the general profession to be present, as well as all members of the Alumni Association, and all graduates of the college.

R. C. Brophy,
J. P. Buckley,
Committee on Publicity.

NATIONAL DENTAL ASSOCIATION.

Committee on History of Dentistry.

Soon after the Buffalo meeting of the National Dental Association in 1905, this committee announced, through the dental journals and otherwise, the exceptional opportunity which had made it possible to place before the dental profession a comprehensive history of dentistry from the earliest times down to the early days of the nineteenth century. Dr. Vincenzo Guerini of Naples, Italy, well known as a dental historian and archeologist, had placed at the disposition of the committee the result of his labors in the field of dental history, which has formed a large and important part of his life-work.

It was the desire of the distinguished author to bring out this book under the auspices of the National Dental Association as a material expression of his appreciation of the contributions which America had made to the progress of dentistry as a profession.

This tribute of the author was sympathetically received by the Committee on History of the N. D. A., not only because of its exceptional merit and the generous sympathy and appreciation which it expressed, but, further, because it furnished in available form and at once the result for which the committee had been created, and for which its members were individually and collectively laboring.

Upon recommendation of the Committee on History, the National Dental Association formally accepted this trust, and pledged its moral support to the enterprise of securing as soon as possible the publication of the work of Dr. Guerini. A thorough canvass of the question from a business point of view disclosed the fact that without a definite, indeed guaranteed market for the book, no publisher could be found willing to undertake the assumed risk of financing the publication, and it was therefore determined by the committee to solicit subscriptions for the work, in order to assure the cost of its publication in advance. Accordingly, and based upon careful estimates, the price of subscription was placed at five dollars per copy, and it was found that not less than 700 copies would have to be subscribed for in advance, in order to guarantee the cost of publication.

By the aid of announcements in the journals, by personal solicitation, and direct appeal by circulars, etc., the present total number of subscriptions received by the treasurer is 400, leaving 300 yet to be obtained before the work of publication can be begun.

The committee asks that all who have not yet subscribed will do so at once. Surely there are enough men in our profession who are interested in its history, and willing to devote five dollars to the securing of such an historical record as has never heretofore been attempted. The matter is ready to put in type, and the book can and will be rapidly put through the press just as soon as the amount necessary to accomplish that end is available for use by the committee.

Send your subscription without further delay to Dr. Chas. S. Butler, treasurer, "The Frontenac," Buffalo, N. Y. Speak of the matter favorably to your colleagues and induce them to do likewise, so that this much-desired object may be consummated without any undue delay. The committee asks that the editors of all dental journals make note of this appeal, and thus lend their important aid to the cause which the committee hopes soon to bring to a successful issue for the benefit of the whole dental profession.

Edward C. Kirk, Philadelphia.
Wm. H. Trueman, Philadelphia.
Gordon White, Nashville, Tenn.
H. L. Ambler, Cleveland, Ohio.
Jas. McManus, Hartford, Conn.
J. Y. Crawford, Nashville, Tenn.
A. H. Fuller, St. Louis, Mo.
S. A. Freeman, Buffalo, N. Y.
W. E. Boardman, Boston, Mass.
Charles S. Butler, Buffalo, N. Y.

Burton Lee Thorpe, *Sec'y*, St. Louis, Mo.
Chas. McManus, *Ch'man*, Hartford, Conn.

A PUBLIC DENTAL LIBRARY

IN THE

City of Columbus, Ohio.

The Trustees of the new Columbus Carnegie Library Building, a handsome structure costing $250,000, have set apart a room 40 by 60 feet for the exclusive use of a Dental and Medical Library.

Columbus being centrally located and of easy access to the majority of the dentists in the state, should be the home of what the dental profession has hitherto been without: a library complete in all the literature of the profession, making it invaluable for research and reference.

The local dentists have organized a Dental Library Association for the express purpose of bringing this matter to a successful issue, and the work thus far accomplished far exceeds our expectations. The Columbus dentists alone have donated $500 in cash and a number of books and magazines.

To make this library complete in embracing all known works pertaining to our specialty and complete files of all the journals published, we desire the co-operation of every dentist in the state. Any old and rare works, copies of old journals, etc., will be gratefully received, inscribed with the name of the donor, and recorded to his credit in the library catalog. Please communicate with us concerning any literature you may have that you can donate to this cause, giving titles and authors of books; names and dates of journals, etc. In case of duplication they will be valuable for exchange with other libraries.

W. H. Todd, *Pres.*,
190 S. High st.
Edward C. Mills, *Sec'y*,
10 Y. M. C. A. Bldg.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

Notice to the Alumni.

Any alumnus not having received a copy of the souvenir number of the *Pennsylvania Dental Times*, giving the proceedings of the golden anniversary of the Pennsylvania College of Dental Surgery, may secure the same by sending his name and address to

Wilbur F. Litch, *Dean*,
Eleventh & Clinton sts., Philadelphia, Pa.

UNIVERSITY OF LEEDS (ENG.)

Degrees in Dental Surgery.

At a meeting of the Court of the University, the following ordinances were adopted with reference to the institution of degrees in dentistry:

(1) The degrees in dental surgery shall be —Bachelor of Dental Surgery (B.Ch.D.); Master of Dental Surgery (M.Ch.D.).

(2) All candidates for the degree of Bachelor of Dental Surgery shall be required to have passed the matriculation examination, to have pursued thereafter approved courses of study for not less than five academic years, two of such years at least having been passed in the university subsequently to the date of passing Parts I and II of the First Examination, and to have completed such period of pupilage or hospital attendance, or both, as may be prescribed by the regulations of the university. No candidate shall be admitted to the degree who has not attained the age of twenty-one years on the day of graduation.

(3) All candidates shall be required to have passed the following examinations: The First Examination, the Second Examination, the Final Examination.

(4) Each examination shall include practical work in the subjects offered.

(5) All candidates shall be required, before presenting themselves for examination, to furnish to the registrar certificates testifying that they have attended the prescribed courses of instruction in accordance with the regulations of the university in each of the subjects which they offer, and that they have fulfilled the other requirements of the ordinance and regulations in respect of such examination.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING OCTOBER 1906.

October 2.

No. 832,263, to Theodore G. Lewis. Fountain spittoon.

No. 832,528, to Ernest C. Bennett. Removable dental bridgework.

October 9.

No. 832,587, to Robert Brewster. Artificial tooth.

No. 832,955, to Henry D. Bultman. Dental plugger.

No. 833,044, to Thomas Goodhugh. Dental instrument.

October 16.

No. 833,204, to Lyter H. Crawford. Dental bite taker.

No. 833,254, to Carl A. Skalstad. Dental crown construction.

No. 833,375, to Leo Dollar. Dental crown slitter and remover.

October 23.

No. 833,883, to John A. Lentz. Process for forming dental structures.

October 30.

No. 834,515, to Ernest De Witt R. Garden. Artificial denture.

No. 834,594, to Crittenden Van Wyck. Obtunding apparatus.

No. 834,676, to Herman C. G. Luyties. Dentifrice.

No. 834,790, to William C. Walford. Dental and surgeon's cabinet.

INDEX TO VOLUME XLVIII.

1906.

Abscess, alveolar, radiographs of, 264, 265
  alveolar, to abort, 540
  chronic alveolar, involving the apices of the canine and first bicuspid, 20
  chronic alveolar, of fifteen years' standing, 20
  chronic alveolar, treatment of, 541
  chronic alveolar, upon anterior root of crowned lower first molar, 23
  incipient, upon root of crowned bicuspid, 19
  without fistula, treatment of, 542
Abscessed teeth, multiple infection following extraction of, 139
Abscesses, chronic, diagram showing technique of root-amputation in the treatment of, 17
  thymol in the treatment of, 1166
Absorbent paper canal-points for pumping chloropercha into large cavities, 1122
Abutments in crown and bridge work, preparation of, 1148
  hood, 721
Actinomycosis and blastomycosis, treatment of, with copper salts, 246
Action of examinations, Otto E. Inglis on, 38
Acute poisoning with tincture of iodin, 612
Acute sinusitis, 662
  of the face, 110
Adenoid vegetations, general health impaired by, 1008
  operation for removal of, 1008
Adenoids, rarely congenital, 1213
  seldom present in children under three months, 1213
  surgical removal the only satisfactory treatment, 1211
  symptoms of, 1210
Adrenalin as a cocain solvent in pressure anesthesia, 761
Advantages of the bandless porcelain crown, 250
  of the clasp, 116
  of the gold inlay over the porcelain one, 615
Advertising methods of the early dentists, 996
Air, compressed, in operative dentistry, 588
Alabama Dental Association, announcement, 369
Alæ of the nose, collapse of, a serious impediment to respiration, 999
Alameda County Dental Society, announcement, 713
Alcohol in general and special therapeutics, 252
Allan, Chas. F., obituary of, 619
Allen, Chas. C., on the growth of dentistry in New York, 996
Alloys and amalgams, 358
Allport, W. W., biographical notes on, 395
Alopecia areata of dental origin, 611
Aluminum, soldering of, 115, 362
Aluminum plates, 115
Alumni Association of Chicago College of Dental Surgery, announcement, 1280
Alveolar abscess, chronic, amputation of the apices of roots in the treatment of, 16
  chronic, resection of a portion of the root in treatment of, 698
  constitutional and local symptoms of, 617
  of fifteen years' standing, 20
  surgical treatment of, 15
  with fistula, treatment of, 1275
Alveolar plate, treatment of chronic alveolar abscess through, 617
Alveoli, post-extraction treatment of, 613
Alypin, a few experiments with, 356
Amalgam, better grade of, should be demanded by the dental profession, 1038, 1040
  introduction of, by Wm. H. Pepys of London, 435
  in dentistry, 1020
  insertion of, with the aid of the Ivory matrix, 844
  mixing, on glazed paper, 1170
  silver, J. L. Murphy on, 435
  some good qualities of, 1043
Amalgam filling, a curious case of mercurial intoxication caused by, 112
Amalgam inlays, 889
Amalgams, investigations on, 1032
American-born people gradually developing better teeth, 1252
American Dental Society of Europe, announcement, 122
American dentist, status of, abroad, 231
American Medical Association—Section on Stomatology, announcement, 513
American Society of Dental Surgeons, organization of, 995
American Society of Orthodontists, announcement, 625, 1174
Ammonia-producing bacteria, 530
Ammonium cyanid in the blood stream, experiments to determine the effect of, 1036
Amobilis root-canal cement, clinic by W. H. Leak, 196
Amputation of the apices of roots in chronic alveolar abscess, 16
Analgesia, blue-light, 501
Anatomical articulator in crown and bridge work, 117
Anchorage in crown and bridge work, 1154
  inlay, for molar, 723
  Jackson's system of, 1187
Anesthesia, cocain, 967
  cocain and adrenalin cocain, 700
  for dental operations, diseases and disorders of the heart in relation to, 882

Anesthesia, general, relation of circulatory diseases to, 813
  local, 69
  nature of the disturbances of respiration during, 813
  pressure, 759
  with nitrous oxid, 944
Anesthetic, a new: novocain, 882
Anesthetic properties of magnesium sulfate, 613
Anesthetics in General and Cocain in Particular (editorial), 1256
Anesthetics, administration of, to patients with heart murmurs, 814
  case of convulsions produced by, 944
  general, contra-indicated in degeneration of the heart, 816
  necessity of thorough examination of patient before administration of, 943
  should be administered in the prone position, 943
Anesthetizing the pulp through occlusal cavities in molars and bicuspids without use of the pressure syringe, 966
Ankylosis (synostosis) a case of dental, 697
Annealing platinum matrix, 885
Anterior bridge abutment, a new, R. L. Simpson on, 488
Antidote, a universal, 507
  for silver nitrate, 1271
Antiseptic method of keeping and using dental medicines, clinic by Coleman Tousey, 184
Antiseptic mouth-washes, 363, 1269
Antiseptic washstand, an, 35
Antiseptics, the halogens as, 364
Antocclusion, 138
Antra, malformed, 856
Antral and frontal sinus, relation of, 4
Antral disease, aspiration in the treatment of, 665
  signs of, 664
  treatment of, 664, 853
Antral empyema, age of patients affected, 832
  caused by the use of galvano-cautery in the nose, 852
  chronic, 8
  description of a case, 855
  extent of involvement, 832
  frequently associated with ethmoid disease and nasal polypi, 851
  intranasal method of treatment, 10
  Jansen's radical method of treatment, 853
  not peculiar to either sex, 851
  opening through canine fossa, 855
  radiograph of, 269
  teeth in relation to etiology of, 832
  John O. Roe on, 850
Antral suppuration, chronic, involving all the sinuses of the face except the frontal, 5
Antrum of Highmore, appliances for directing fluids into, 72
  avenues through which the central cavity is reached, 834
  causes of empyema of, 832
  cyst of, 786
  diagnosis of disease of, 852
  diseases of, 78
  etiology and treatment of acute and chronic empyema of, 1
  etiology of empyema of, 831
  form of, 1
  infection of, by diseased teeth, 3, 851
  infection of, from a rhinological point of view, 851
  location of disease in, 832
  method of continuing drainage in, 834
  natural opening of, into nose, 4
Antrum of Highmore, statistical study on empyema of, 831
  teeth which encroach upon the floor of, 1
  treatment of empyema of, 834
Antrum abscess, causes of, 6
  diagnosis of, 8
  pathology of, 5
  symptoms, 7
  treatment, 8
Antrum suppuration, relative frequency of, 852
Apparatus for testing the resistance of porcelain by shear force and percussion, 131
  to measure the triturating force necessary for mastication, 1190
Appliances for the correction of irregularities, clinic by F. Messerschmitt, 196
Application of cocain in dental practice, new method, 1264
  of topical remedies, 1271
Approximal cavities, preparation of, for porcelain inlays, 1048
Approximal fillings, a source of failure in, 115
Arch, anterior part of, influence of first permanent molar on its development, 729
  expansion of, in a child of four years, 1128
  expansion of contracted anterior portion of, 279
  Jackson's appliance for contraction of, 280
Arches, contraction of, produced by thumb-sucking, 1082
Arizona Board of Dental Examiners, 635, 1176
Arkansas State Dental Association, announcement, 517
"Arm and finger system" (Jackson) of correcting dental irregularities, 1122
Army and Navy Dental Bills (The Pending), (correspondence), 1104
Army Dental Corps, 255, 812, 979
Arsenic, cases requiring the use of, 766
  in combination with cocain and formaldehyd paste, 764
Arsenic mixtures, utility of coloring, with lampblack, 966
Arsenical necrosis, 80
Arterial disease, treatment of, 128
Arterial system, degeneration of, 126
Arteries, danger of cutting, 80
Arterio-sclerosis, 126, 815
"Arthur" method of separating teeth, 1019
Arthur, H. W., "President's Address" (New York State Dental Society), 1142
  "Readily-made Matrices and Their Application," 35
Arthur, Robert, biographical notes on, 394
  contributions of, to dental literature, 394
"Arthurizing" teeth, 394
Articulation, characteristic, in mandibular protrusion, 257
  early methods of obtaining, 862
  meaning of the term, 867
  occlusion and antagonism, difference between, 1125
Articulator, to remove model from, 700
Artificial dentures, artistic, 507
Artificial teeth, limited stress of, 1047
  normal articulation of, 311
  producing the natural contour of, on lingual and palatal surfaces, 551
Atheroma, 126
Atkinson, Wm. H., biographical notes on, 396
Atlanta Dental College, commencement of, 796
Automatic obtunder, 760
Automatic plugger, to facilitate the handling of, 361
Avulsion of the terminal branches of the trigeminal nerve for the cure of trifacial neuralgia, 360

BACKING, easy method of, 1171
  for facings, 1062
Backing facings and gold corners on porcelain teeth, 888
Backing teeth, 1171
  to relieve strain on the porcelain in, 616
Backings, a guide in punching holes in, 1166
Bacteria, conditions necessary for their growth, 593
  heat and moisture essential to development of, 1101
  in the intestinal canal, estimated number of, 531
Bacterial growth, factors which influence, 1101
Bacteriological and chemical constituents of large bodies of water, effect of copper sulfate on, 250
Bain, Seneca B., "Physical Methods in the Practice of Dentistry," 1193
Baker, John, biographical notes on, 983
Ballachey, Fred A., "Specialization in Dentistry," 935
Baltimore College of Dental Surgery, alumni of, 370
  commencement of, 706
Baltimore Medical College, Dental Department, commencement of, 802
Band, removing, 1062
Bands, wide and narrow, 1232
Barber, C. J., "Some Attachments for Crowns and Bridges," 755
Barnes University Dental Department, commencement of, 799
Barnum, Sanford C., biographical notes on, 395
Barton's bandage, 31
Base-wires of German silver for regulating purposes, 1086
  solder used for, 1086
Baume on the first dentition, 434
Beach, J. Wright, "The Control of Patients," 1109
Bean's splint, 30
Bebb, Wm., "A Criticism of the Discussion upon an Essay Entitled 'Is There an Ideal Occlusion in the Human Jaws?'" 545
Beck, Chas. S., memorial resolutions, 892
  obituary of, 509
Beesley, Edward M., obituary of, 1173
Beeswax formerly used for molds upon which artificial plates were made, 994
Bell, Thomas, his contribution to the literature of dentistry, 425
Bending a wire, 504
Bending the arch, 1061
Benocclusion, 138
Berdmore, Thomas, reference to work of, 424
Beta-eucain lactate, 1061
Bethel, L. P., "A Few Observations," 160
Bicuspid, first, replacing of, where second bicuspid is decayed, 725
  protrusion of, 758
  upper, incarcerated germs of, radiograph of, 272
Bicuspid facing, preparation of, 758
Bicuspid hoods, 724
Bicuspids, extraction of, in cases of decided upper protrusion, 375
Bing bridge, 290
Bing-stop and Richmond crown combination bridge, 292
Bing-stop bridge, M. L. Rhein's modification of, 293
  three styles of, 292
Bing-stop gum-saddle Richmond crown combination bridge, 293
Binnie, John F., "Manual of Operative Surgery," review of, 497
Biography of Walter Webb Allport, 395
  of Robert Arthur, 394
  of Wm. H. Atkinson, 396
  of Sanford C. Barnum, 394
  of Greene V. Black, 398
  of John Skinner Clark, 393
  of Wm. Henry Dwinelle, 397
  of Chapin Aaron Harris, 392
  of Horace H. Hayden, 391
  of Edward Hudson, 389
  of Henry J. McKellops, 396
  of Wm. Henry Morgan, 397
  of Jonathan Taft, 397
  of Elisha Townsend, 392
  of Joshua Tucker, 393
  of Marshall H. Webb, 396
Bismuth subiodid, hemostatic and stimulating properties of, 249
Bite, correct, may exist in company with obtuse angle of the jaw, 1075
  correct, to take, 1168
  forward, photographs illustrating, 1077
  impression, how to take, 968
  method of opening, 771
"Black tongue," study of, 1163
Black, G. V., "Consideration of Evidence in Scientific Investigation," 1015
  banquet to, 1279
  biographical notes on, 398
Black's experiments as to force required for mastication, 1190
Black's method of protecting surface of gold foil, 152
Black's experiments as to force required for dentin, 1102
Blair, Vilray Papin, "Report of a Case of Double Resection for the Correction of Protrusion of the Mandible," 817
Blake, Robert, his contribution to the literature of dentistry, 425
Bleached tooth, to overcome the tendency to rediscoloration of, 949
Bleaching agents, effects of, upon tooth-texture, 948
Blue-light analgesia, 501
Boardman, Waldo E., "President's Address" (National Dental Association), 200
Boenning, Henry C., "Some Lesions of the Mouth with which the Dentist Should be Familiar," 651
Boils of dental origin, 592
Bonwill crown, date of advent, 286
Boston and Tufts Dental Alumni Association, 1176
Borax, to prevent bubbling of, 966
Boulter, Henry H., obituary of, 119
Bread, triturating force necessary for mastication of, 1191
Breath, fetor of, 611
Bridge, Bing-stop and Richmond crown combination, 291
  Bing-stop and Richmond crown, two-substitute, 292
  Bing-stop baked-body substitute, 292
  Bing-stop, gum-saddle Richmond crown combination, 292
  Bing-stop, hood with headed pin and arm-span, 292
  Bing-stop, M. L. Rhein's modification of, 293
  Bing-stop, wing-end, coupling-bar Richmond, 294
  cap-crown, one-substitute shoulder-pier, wing-substitute, 295
  combination Richmond, cap-crown and wing gum-rest, 295
  cusp-cap, 296

Bridge, fourteen-substitute, 295
  half-hood pier-pin and cap-crown, fixed, 295
  large upper, embracing canines and molars, construction of, 1150
  lug and socket removable, 300
  of the Richmond type, disagreeable consequences of, 296
  on live piers, 296
  open, 301
  pier and saddle span, 291
  pin-plate, 291
  porcelain and clasp removable, 302
  porcelain replaceable open-face crown guide and clasp, 301
  removable, 297
  Richmond crown and saddle, 298
  Richmond four-substitute, 294
  Richmond six-anterior and pier-post, 294
  saddle four-stop, 291
  saddle two-stop and pier-post, 291
  setting with cement, 404
  slotted teeth, 301
  with four abutments, setting of, with gutta-percha cement, 1156
Bridge abutments, description of, 402
  paralleling of, without devitalization, 860
Bridge attachments, for case requiring restoration of bicuspids, 721
Bridges, occlusion for, 966
  removable and stationary, 859
Bridge work, 924
  literature of, 307
  method of tipping teeth for, 555
  removable and fixed, 774
  Ricci (1816) on, 436
  some phases of, 290
Broken crown facings, restoration of, 192
Broken facing, an easy way to repair, 964
Broken pins, removing from roots, 1065
Broken plate, to wax together the fragments of, 363
Broomell, I. N., "A Plea for Continued Effort in the Field of Dental Literature," 824
  "Is Oral Cleanliness the Chief Factor in the Prophylactic Treatment of Dental Caries?" 1100
Brown, D. J., "Multiple Infection Following Extraction of Abscessed Teeth," 139
Brown, G. V. I., "The Diagnostic Value of the Central Facial Line," 1200
Bubbles in porcelain, to prevent, 887, 890
Buckley, J. P., "The Rational Treatment of Putrescent Pulps and their Sequelæ," 537
"Bulk" shading *vs.* "layer" shading, 617
Bullock's splint, 30
Burkhart, A. P., "A Higher Ideal in Crown and Bridge Work," 1147
Burs, round, in cavity preparation, 885
  surgical, 16
Burs and mandrels, and how to care for the handpiece, 616
Burt, Willis Perry, obituary of, 891
Byram, J. Q., "Some of the Phenomena of Colors in Porcelain Inlay Work," 929

CADAVERIN, 538
Cajuput, oil of, 1168
Calculi, to soften, 966
Calculus in Wharton's duct, complicated by suppuration with involvement of the submaxillary and sublingual glands, 358
Caldwell-Luc operation, 853
California State Dental Association and the Alumni Association of California University, Dental Department, joint meeting, 370
Call for an International Mass Meeting of Dentists, 1278
Canadian Dental Association, announcement, 713
Cancer, diagnosis and treatment of, with the X ray, 637, 643
  of lip, immunity of women to, 57
  of lip, tongue, etc., 329
Canine, upper left impacted, radiograph of, 272
  upper right impacted, radiograph of, 271
Canines, attachments for, 759
  upper labial, mal-eruption of, 375
Cantwell, J. J., "Pressure Anesthesia," 759
Cap, floor of, to prepare for a porcelain crown, 699, 1167
Capping of the pulp, 786
Caps, gold, method of making, 606
  polishing of, 1151
Carbohydrate fermentation, 538
Carbolic acid for cleaning cavities, 615
  instead of cocain in pressure anesthesia, 766
Care of the mouth and teeth, 245
Cardiac hypertrophy, 814
Caries, factors in the production of, 1239
  influence of diet upon, 1240
  non-prevalence of, among the ancients, attributed to natural life led by them, 1101
  not dependent upon purely local conditions, 1102
  osteoclasts in: process of tooth-destruction at the carious zone, 358
  period of immunity to, 774
  prevention of, views of Fox on, 827
  process of, dependent upon a fermentative change, 1035
  where most frequently found, 1240
Caries and gelatinous plaques on the teeth, relation between, 1038
  and the nature of the saliva, 357
Carnivora, no lateral jaw movement used by, 1190
Carving material, plaster of Paris and paraffin wax an excellent, 115
Carving-wax for crown and bridge work and other uses, 250
Case, Calvin S., "The Question of Extraction in Orthodontia," 373, 521
Cases of irregularity involving in their correction the use of intermaxillary reciprocal force, clinic by H. E. Kelsey, 562
  of post-extraction infection, 139
Cast, plaster, to harden and protect, 504
Cavities for porcelain inlays, how to ascertain whether correctly prepared, 822
  in which the use of porcelain is contra-indicated, 508
  not subject to occlusal stress, preparation of, for inlays, 821
  shallow erosion, treatment of, 504
  subject to occlusal stress, preparation of, for inlays, 821
Cavity, should be viewed from left side of chair, 885
  to obtain a correct impression of, 481
Cavity formation in porcelain inlay work, 1027
Cavity lining for gold fillings, oxyphosphate as a, 1121
Cavity margins for inlays, 791
Cavity preparation, 116
  a point in, 250
  for inlays, stages in, 668
  for porcelain inlays where incisal angles are involved, 821
  shading and setting of inlays, 1048
Cavity seat, the flat, 504
Cell nutrition, 1095
Cement as an aid in starting gold fillings, 1171
  attachment of, to solid gold inlay, how to secure a better surface for, 1167

Cement, behavior of, under different climatic conditions, 1271
  danger of, to pulps, 772
  for regulating bands, mixing, 1062
  for setting bridges, 404
  for setting inlays, question of the color of, 931
  its influence in the success of porcelain inlays, 1025
  not always the weak factor in a porcelain inlay, 1045
  reinsertion of dislodged gold fillings with, 776
  to carry a small portion of, 886
Cement and gold for hygienic filling, the effect of heat in combining, 557
Cement fillings, 505
  should overlap cavity margins, 1272
Cement linings with amalgam fillings, 1170
Cementation of crowns and bridges, 1152
Cementing the inlay, 967
Cements, crystallization of, under pressure, 823
  investigations on, 189
  soft, use of, under gold, 563
Central facial line, its value in diagnosis, 1203
Central incisor, case of healing of comminuted fracture in root of, 963
Central Misouri Dental Association, announcement, 1174
Central Nebraska Dental Society, announcement, 1068
Central-Verein Deutscher Zahnärzte, announcement, 1174
Ceramic age of prosthetic dentistry, 862
Cereals, triturating force required for mastication of, 1190
Cerebral circulation, influence of mastication on, 881
Chapple, John A., obituary of, 703
Cheek, voluminous cancroid of, 612
Cheek pouches, importance of thorough examination of, in dental diagnosis, 652
Chicago College of Dental Surgery, announcement of eleventh annual clinic, 122
  commencement of, 802
Chilcott, Langdon S., "Obstetrical Deformity of the Mandible," 257
Children, control of, by the dentist, 1115
  stomatitis in, 789
Children's teeth, filling with gold, 701
  temporary operations or gold fillings in, 700
Chittenden, Chas. C., obituary of, 252
  memorial resolutions, 892
Chloroform, action of, on the heart, 817
  applied upon the gums, 560
Choanæ, anatomical structure of, 999
Chronic alveolar abscess, treatment of, through the alveolar plate, 617
Chronic diseases, thorough mastication an aid in the treatment of, 503
Chronic empyema, 665
Cincinnati College of Dental Surgery, commencement of, 706
Cigrand, B. J., "Mandibular Action: Its Influence on the Entire System," 457
Circulatory diseases, prevalence of, among physicians and dentists, 126
Clack, W. R., "The Necessity for, and a Method of Preserving the Integrity of the Interproximal Space," 399
Clapp, Dwight M., obituary of, 1172
Clark, John S., biographical notes on, 393
Clasp, advantages of, 116
Clasps, forms and materials for, 885
  two methods of making, 888
Clean teeth and good health, 117
Cleaning wax, 1271
Cleft palate, acquired or congenital, 658
Cleft palate, age at which operations should be performed for, 659
  mechanical treatment of, 659
  obturator for correction of, devised by Ambroise Paré, in 1541, 660
  vela for correction of, 660
  Norman W. Kingsley on, 658, 660
Cocain in dental practice, new way to apply, 1264
Cocain and adrenalin-cocain anesthesia, 700
  death following extraction of a tooth under, 1061
Cocain anesthesia, 967
Cocain hydrochlorid solution, sterilization of, 111
Cocain pressure anesthesia, technique of, 759
Cocain solutions applied to mucous membrane by the aid of compressed air, 589
Cohesive gold, the originator of, 394
College graduates, the question of giving advanced standing to, in dental schools, 752
College of Dentistry, University of Illinois, commencement of, 801
College of Oral and Dental Surgery of New York, commencement of, 800
College of Physicians and Surgeons, Dental Department, commencement of, 796
Colorado College of Dental Surgery, commencement of, 802
Colorado State Dental Association, announcement, 903
Color, "Brewster" theory of, 930
  qualities of, 930
  "selective absorption," a factor in producing, 929
Combination method of making gold caps, clinic by J. F. Mayer, 605
Commensalism, 528
Compressed air, use of, in operative dentistry, 588
  James McManus on, 590
Conceptions of the basic facts of science continually differing, 1015
Concerning Anesthetics in General and Cocain in Particular (editorial), 1256
Concerning Hobbies (editorial), 494
Condensing gold foil, forces employed in, H. Herbert Johnson on, 671
Condyle, fractures of the neck of, 829
Condyloid process of mandible, diagnosis of fractures of, 32
Connecticut Dental Commissioners, 978
Connecticut State Dental Association, announcement, 122, 515, 810
  proceedings of, 946, 1214
Conservative dentistry, a plea for, 250
Conservative intranasal methods, 10
Consolidation of implanted teeth, investigations on, 1058
Constructing porcelain inlays with a view to overcoming shadows, clinic by Robert Brewster, 607
Continued mild medication in the treatment of pyorrhea, 250
Continuous-gum denture, repairing fractured teeth of, 607
Contour of artificial teeth, a method for reproducing, in dentures, 551
Controlling alveolar hemorrhage, 1272
Conzett, J. V., "Gold as a Filling Material," 151
Copper salts, treatment of actinomycosis and blastomycosis with, 246
Copper sulfate, effect of, upon the bacteriological and chemical constituents of large bodies of water, 250
Coronoid process of mandible, diagnosis of fractures of, 32

Correct impression, to secure, 1169
Corrections, 494, 496, 1056
Correspondent's Report (New York State Dental Society), by Ellison Hillyer, 94
Corrosive sublimate, painless application of, 1166
Cotton, to hold, on a smooth broach, 1166
Cracks in the enamel due to expansion of metallic fillings, 1272
Cresol, 540
"Crib" appliances, 1233
Critic, The Destructive (editorial), 690
Cross, Harold DeWitt, 29
Crown, a new porcelain, Clint W. LaSalle on, 146
  bandless porcelain, advantages of, 250
  construction of, over remaining post of fractured crown, 607
  gold, originator of, 286
  half-banded porcelain pivot, 288
  of vulcanite plate, tooth backed with rubber, 285
  open-face, method of making, 747
  porcelain, a new method of adjusting, 557
  porcelain-face, 1149
  porcelain-post, construction of, upon irregularly broken-down root, 607
  Richmond, 1149
  Sanger's half-collar, 310
  shell, 1149
  temporary, to make in ten minutes, 251
Crown and bridge articulator, how to improve, 1062
Crown and bridge work, a higher ideal in, 1147
  anatomical articulator in, 117
  carving-wax for, 250
  development of, 285
  different requirements presented by each individual case, 922
  pathological phase of, 1153
  preparation of abutments in, 1148
  removable backings in, 656
  slovenly, frequency of, 1155
  some phases of, W. Storer How on, 290
  some suggestions in, 926
  use of the rubber dam in, 1148
  studying principles and requirements in, necessity of, 922
  D. O. M. LeCron on, 921
  Geo. Evans on, 922
Crown facings, broken, restoration of, 792
Crown metals, 758
Crowning a root decayed below the gum margin, clinic by W. A. Brownlee, 556
Crowns, 251
  banded and unbanded, 1275
  gold, made from one piece of metal, 846
  shell and band, disadvantage of, 507
Crowns and bridges, investing, 1150
  some attachments for, 755
Cryer, M. H., "Some of the Factors that Modify the Human Jaws and Other Portions of the Face," 1071
Crystallization of cement under pressure, 823
Culver, M. B., "Insertion of Fillings of Platinum-Gold in Conjunction with Gold," 605
Cusps of artificial teeth, smooth and deep, relative value of, 314
Cysts, classification of, 905
  description of several cases of, 910
  of the antrum, 786
  of the maxilla, of dental origin, 499
  of the oral cavity; ranula, 905
  of the tongue, treatment of, 909

Da Costa on bone diseases, 1102
Darby's tin, clinic by J. H. Beebee, 561
D.D.S., the, abroad, R. H. Hofheinz on, 230
D.D.S. degree, tardy recognition of, in foreign countries, 230
Death, causes of, in 2142 physicians, 125
  following septicemia induced by alveolar abscess, 140
Decalcification, extensive, produced by excessive candy eating, 1241
Decay, average of, in clean and unclean mouths, 1102
  black, report of progress of two cases, 1031
  inlays immune to, 616
  investigations on the processes of, 1029
Deciduous teeth, upper protrusion of, 1166
DeCrow, Warren, *In memoriam* resolutions, 973
  obituary of, 891
Degeneracy, study in the signs of, 880
Degeneration of the arterial system, 126
Delavan on deflection of the nasal septum, 1006
Delayed eruption, a case of, 699
Delta Sigma Delta Fraternity, announcement, 977
Demonstration of old-fashioned hand-carved teeth, clinic by W. H. Neall, 606
Denker's operation, 12
Dental advertisements, old, 983-993, 1141
  early ethics of, 996
Dental ankylosis (synostosis), a case of, 697
Dental caries and gelatinous plaques on the teeth, relation between, 1038
  and the nature of the saliva, 357
  osteoclasts in: process of tooth-destruction at the carious zone, 358
  period of immunity to, 774
  prevention of, views of Fox on, 827
  process of, dependent upon a fermentative change, 1035
Dental cleanliness, what it involves, 1238
Dental college, first, permanent organization of, 392
Dental colleges, connected with medical colleges and hospitals, advantages of, 1098
  dual form of activity found in, 1247
  present laxity in entrance requirements, 1181
  services they should render, 1247
  the better grade of, outlay seldom covered by income in, 1246
  why endowment is necessary, 1247
Dental Department of Washington University, Alumni Association, announcement, 628
Dental development, arrest of, 1252
Dental Education (editorial), 780
  errors in, 731
  from a new standpoint, 739
  H. W. Arthur on, 1145
Dental engine, improvements in, 155
  cases in which it might profitably be used by the surgeon, 155
Dental fluoroscope, Tousey's, 639
  demonstration of, 640
  thin sheet of glass the best covering for, 640
Dental graduate, the first, 394
Dental history, 1225
  a proposition for, 687
Dental History (editorial), 352
Dental History, The Repeating Tendency in (editorial), 104
Dental indications of serious systemic disorders, 1204
Dental inventions, early, 995
Dental irregularity in a syphilitic, 961
Dental irregularities, correction of, by the Jackson system, 1085
  some cases illustrating, 1087-1090
  too little attention given to etiology of, 1206
Dental journals, 1220
Dental law for Porto Rico, 120

Dental law for the Philippines, 620
Dental Legislative Movement, The, in Australia (editorial), 872
Dental literature, 824, 1251
Dental manifestations of systemic diseases, 1094
Dental needs of a large community, 1247
Dental Obturator, editor of, 393
Dental office, furnishing of, 1216
Dental operations, factors to be considered in, 1044
Dental organs, diseases of, syphilis of the maxillæ in relation to, 696
Dental organs and systemic diseases, relation between, 1238
Dental origin of alopecia areata, 611
  of cysts of the maxilla, 499
Dental patients, control of, 1109
  the various kinds of, 1111
Dental pioneers, 994
Dental practice, mummifying agents in, 118
  some helpful ideas in, 888
Dental practitioner, duty of, to properly sterilize instruments, 912
  liability of, to criminal prosecution should infection occur as a result of neglect of proper antiseptic precautions, 912
Dental profession, specific factors in its status, 1215
Dental prophylaxis, what it means, 1242
Dental reciprocity, 1144
Dental refrigerant, clinic by M. L. Fay, 562
Dental research work, appreciation of, by members of the profession, 163
  unity in, 163
Dental school, giving advanced standing to college graduates in, 752
  proportion of college graduates among matriculates of, 735
Dental service in the army and navy in the Philippines, assignments, 212
  field equipment, 210
  office accommodation, 211
  supply stock, 211
  transportation facilities, 210
Dental societies, and general research work, 160
  and the public press, 1220
  instances of increasing membership, 161
  organization of, 1143
  routine business of, best kept from general sessions, 161
Dental society members, individual work done by, 162
Dental Society of the State of New York, announcement, 254, 515
  clinics at, 195
  proceedings, 187, 1023, 1130, 1209
Dental Society, The Oldest (correspondence), 934
Dental specialists, division of, into two classes, 938
  experience and training necessary for, 939
  the field of, 937
Dental stock colleges, 1221
Dental student, comparison of, with the medical student, 1223
  preliminary education of, 737
Dental surgeon, stomatologist a better term for, 1095
Dental terms, misunderstandings caused by lack of accurate, 148
Dental therapeutics, picric acid in, 884
Dental writers of the eighteenth century, D. W. Fellows on, 422
Dentin, obtundents for, 505
  recalcification of, under tin fillings, 447
  sensitive, obtunding, 615
  sensitive, treatment of, 92, 115
Dentin and true ivory, resemblance between, 672
"Dentinitis," A Stubborn Case of (correspondence), 840
Dentinitis from Diabetes (correspondence), 1106
Dentist, the, a certain dignity should be maintained by, 1215
  and rhinologist should work together, 661
  appreciation of, by the public, 1215
  conditions with which he should be familiar, 1095
  his place in the modern crusade against the ravages of tuberculosis, 1205
  must understand normal conditions of nutrition, 1096
  necessity of guarding, against infection from patients, 653
  preventive work should be the first aim of, 661
  should avoid "fads and fancies," 1114
  should be familiar with formulæ of drugs and materials he uses, 1020
  should possess accurate knowledge of oral anatomy, 651
  should possess knowledge of general pathological conditions, 1096, 1213
  the cultured, 1216
  treatment of patients by, 1114
  variety of operations performed by, 940
Dentistry, advancement of, 160
  American and European, 1228
  American, standing of, in Germany, 753
  as a specialty of medicine, 1093, 1221
  as practiced by the ancients, 935
  at a standstill during the middle ages, 935
  conservative, a plea for, 250
  development of, E. C. Kirk on, 731
  elements of success in, 1114
  entered upon its career as dental surgery in 1835, 1093
  great men of, 1140
  hypnotism, mental science, and "Christian science" as applied to, 1116
  limitations of, to its mechanics, 732
  modern, possibilities of, 419
  non-appreciation of research work in, 734
  not a specialty of medicine, 936
  on the Portuguese West Coast of Africa (correspondence), 673
  operative, the field of, 936
  physical methods in the practice of, 1193
  position held by, 982
  position of, in the field of medicine, Val. McDonald on, 154
  progress of, recorded in its current literature, 1093
  prosthetic and operative, should be followed separately, 937
  research work in, 162
  scientific training and up-to-date apparatus essential in, 1182
  specialization in, 935, 1230
  study of its history, 982
  unwritten history of, 997
Dentist's Magazine, recent publication of, 498
Dentists, an open letter to, on preventive dentistry, 1175, 1278
  a "wasteful lot," 793
Denture, artistic artificial, 507
Dentures in normal occlusion, worn-down incisors and canines in, 304
  temporary, 615
Desault-Küster operation, 13
Destructive Critic, The (editorial), 690
Detachable tooth-bridge, clinic by H. H. Tompkins, 198
Detroit College of Medicine, Dental Department, commencement of, 894

Dewey, Martin, "There is 'An Ideal Occlusion of the Teeth in the Human Jaws,' " 302
Diabetes, dentinitis from, 1104
Diagnosis by means of the X ray, 262, 638
  of incipient pyorrhea, 617
  of oral diseases, dental literature deficient in reference to, 1200
Dieffenderfer, W. E., "Method of Making an Open-Face Crown" (clinic), 747
Diet, influence of, on tooth-formation, 1193
Dills, W. B., "Past, Present, and Future of Porcelain in Dentistry," 479
Dionin, 788
Diphtheria, mouth-manifestations of, 653
Diphtheric patches, 330
Discovery of the X ray, 260
Discussion on "Action of Examinations," 38
  on "Administration of Somnoform," 845
  on "A Few Dental Writers of the Eighteenth Century," 434
  on "A Few Experiments in Porcelain," 451
  on "A Few Observations," 164
  on "A Higher Ideal in Crown and Bridge Work," 1152
  on "Amalgam Filling with the Ivory Matrix," 844
  on "A Method of Making Soldered Gold Crowns from One Piece of Metal," 846
  on "A New (?) Anterior Bridge Abutment," 490
  on "A Plea for a Proper Appreciation of Occlusion," 685
  on "A Plea for Continued Effort in the Field of Dental Literature," 846
  on "A Practical Talk on Orthodontia," 1234
  on "A Proposition for a Dental History," 688
  on "A Review of the Question of the Treatment of Putrescence as Related to Pulps and Pulpless Teeth," 466
  on "Cavity Preparation and the Shading and Setting of Inlays," 1050
  on "Chemical Principles Involved in Tooth-Discoloration," 949
  on "Consideration of Evidence in Scientific Investigation," 1040
  on "Correcting Dental Irregularities by the Jackson System," 1123
  on "Correspondent's Report" (New York State Dental Society), 98, 1130
  on "Crown and Bridge Work," 1231
  on "Dental Education from a New Standpoint," 751
  on "Developmental Pathology and Tooth-Decay," 62
  on "Empyema of the Maxillary Antrum: a Statistical Study," 850
  on "Gold and Tin," 61
  on "Gold as a Filling Material," 426
  on "Gold Fillings *versus* Porcelain Inlays," 1046
  on "Gold Inlays for Bridge Anchorages; also Hood Abutments," 768
  on "Guarding the Cavo-Incisal Edges of Porcelain Inlay with Gold," 843
  on "Hyperacidity of the Saliva: Some Causes and Some Effects," 455
  on "Is Oral Cleanliness the Chief Factor in the Prophylactic Treatment of Dental Caries?" 1238
  on "Is There an Ideal Occlusion of the Teeth in the Human Jaws?" 170
  on "Mandibular Action: Its Influence on the Entire System," 463
  on "Metabolism as a Connecting Link between Dental Surgery and Dental Medicine," 1228
Discussion on "Maxillary Fractures," 53
  on "Mouth-breathing," 1209
  on "Normal Articulation of Artificial Teeth," 313
  on "Obstetrical Deformity of the Mandible," 327
  on "Open and Close-Bite Malocclusion," 317
  on "Oral Sepsis," 598
  on "Oral Surgery," 77
  on "Orthodontia," 320, 842
  on "Outside of Dentistry," 56
  on "Past, Present, and Future of Porcelain in Dentistry," 482
  on "Pioneer Dentistry in New York: an Historical Study," 1139
  on "Pressure Anesthesia," 760
  on "Readily-made Matrices and their Application," 158
  on "Recent Work with the X Ray and High-Frequency Currents in the Diagnosis of Dental Cases and in the Treatment of Pyorrhea Alveolaris," 676
  on "Report of Committee on Practice" (New York State Dental Society), 89
  on "Report of Committee on Scientific Research" (Dental Society of the State of New York), 192, 1034
  on "Some Attachments for Crowns and Bridges," 757
  on "Some Modern Thoughts Along the Line of Oral Hygiene," 453
  on "Some Observations upon the Obscure Etiology of Pyorrhea Alveolaris," 477
  on "Some of the Factors that Influence the Human Jaws and Other Portions of the Face," 1252
  on "Some of the Phenomena of Colors in Porcelain Inlay Work," 1024
  on "Some Things About Alloys not Generally Understood," 46
  on "Specialization in Dentistry," 938
  on "Symbiosis with Particular Reference to the Bacteria of the Alimentary Canal," 568
  on "The Control of Patients," 1117
  on "The D.D.S. Abroad," 232
  on "The Influence of Mastication upon the Teeth," 183
  on "The Necessity for and a Method of Preserving the Integrity of the Interproximal Space," 437
  on "The Need of Endowment for Dental Schools," 1247
  on "The Nomenclature of Orthodontia," 239
  on "The Possibilities of Modern Dentistry," 472
  on "The Professional Man's Disease," 470
  on "The Rational Treatment of Putrescent Pulps and their Sequelæ," 574
  on "The Regeneration of Dental Prosthesis," 866
  on "The Relation of Circulatory Diseases to General Anesthesia," 942
  on "The Status of the Profession" 1221
  on "The Strength of Porcelain when Used as a Tip or Corner," 444
  on "The Surgical Treatment of Chronic Alveolar Abscess," 40
  on "The Use of Compressed Air in Operative Dentistry," 590
  on "The Uses of the X Ray in Dentistry," 591
  on "The X Ray in Dentistry," 342
  on "Thoughts on the Development of Crown and Bridge Work," 307
  on "Three Years' Service in the Philippines," 224

Discussion on "Tin and Gold: Its Possibilities and Uses as a Filling Material," 446
Disease, the professional man's, 125
Diseases, systemic, due to the accumulation of germs in the mouth, 736
  systemic, of dental origin, 594
Disinfectants for instruments, 700
Disinfection of the hands, 115
  of the mouth, 695
District of Columbia Board of Examiners, 719, 1178
District of Columbia Dental Society and the Maryland State Dental Association, union meeting, announcement, 715
Drugs, to preserve from the action of light, 362
Duplicating plaster models with gelatin, steps in the process of, 365
Durck on general harmlessness of bacteria without other factors, 1205
  on pneumonia, 1206
Dwinelle, Wm. H., biographical notes on, 397

Ear, middle, diseases of, traceable to a septic mouth, 595
Easy method of making gold inlays, clinic by W. A. Capon, 860
Ebers' papyrus, medical features of, 251
Education Dental (editorial), 780
  dental errors in, E. S. Talbot on, 731
  dental, from a new standpoint, 739
  preliminary, of dental students, 737
Educational requirements, preliminary, for dental students in New York State, 754
Effects of heat in combining cement and gold for hygienic fillings, clinic by Levi C. Taylor, 557
Eighth and Seventh District (N. Y.) Dental Societies, union meeting, proceedings, 751, 850
E. K. Wedelstaedt Club of Iowa, announcement, 715
Elevators in the removal of impacted third molars, 421
Ellerbeck, Wm. Leon, "Comments on General Practice," 1179
Empyema of the antrum, 1
  of the antrum, a statistical study of, 831
  of the antrum, radiograph of, etiology of a case, 269
  of the maxillary sinus, etiological forces, 663
  of the maxillary sinus, 661
  of the maxillary sinus, after-treatment, 666
  of the maxillary sinus, predisposing and exciting causes, 663
  of the maxillary sinus, surgical treatment of, 666
Enamel, for porcelain work, Ascher's artificial, 1049
  for porcelain work, Brewster's XX, 1049
Enamel, teeth devoid of, 788
Enamel margins, care of, 1168
Endarteritis, 126
Endowment for dental schools, advantages of, 1248
Enlarged foramina and perforations treated with lead, 357
Enzymes, part played by, in the process of digestion, 1096
Epithelioma, importance of early recognition of, 56
  of the lip, characteristics of, 57
  of the tongue, 58
  of the jaws, 59
Epulitic growths, 78
Erosion, as described by Fauchard, 423
Eruption, delayed, a case of, 699
  of teeth, views on the cause of, 826
Etching porcelain inlays, 823
  vs. grooving of inlays, 1272
Ether, advantages of general anesthesia by, 816
  some injurious after-effects of inhalation of, 942
Ethics, A. H. Peck on, 409
Ethics and Professional Progress (editorial), 1157
Ethyl and methyl derivatives, assumed innocuousness of, 788
Ethyl Chlorid as an Anesthetic: Remarks on Dr. Friedland's Statements (correspondence), 1022
Ethyl chlorid as a general anesthetic, 837
  fatalities caused by the use of, 837
  mortality rate of, 838
Etiology of noma, 1269
Evil of the toothpick, 506
Expansion of the arch, Jackson appliances for, 279, 1234
Experiments with alypin, 356
Explosion with sodium dioxid, 359
"Extension for prevention," 1044
  not a new thought, 731
Extensive necrosis and secondary fracture of the mandible of dental origin, 696
Extracted teeth, tabulation of 3000, 962
Extraction, in orthodontia, Calvin S. Case on, 373, 521
  in the treatment of malocclusion, 684
  of abscessed teeth, multiple infection caused by, 139
  of a congenital tooth in an infant, death following, 1165
  of impacted lower left third molar, appliance for bringing into position for, 1092
  when the hypodermic needle is employed, 1271

Face, acute sinusitis of, 110
  sinuses of, 74
Face-bow, use of, in the setting up of artificial teeth, 312
Facial features, restoration of, 868
Facial lines and jaws, relationship between, varies in different individuals, 684
  must be harmonious, 684
Facial harmony best exhibited in unmixed races, 1072
Facial paralysis following extraction of a number of roots, 356
Facial restoration, a case of, 275, 416
Facing, broken, an easy way to repair, 964
Facings, protection for, 699
Fatal intoxications with small doses of potassium chlorate, 359
Fauchard and his work, 422
  W. H. Trueman on, 434
Faucial tonsils, frequently the focus of infection and disease, 1007
  hypertrophied, mouth-breathing caused by, 1006
Faught, Francis Ashley, "Empyema of the Maxillary Antrum: a Statistical Study," 831
Faught, L. Ashley, "Metabolism as a Connecting Link Between Dental Surgery and General Medicine," 1093
  "The Choice of a Proper Filling Material," 601
Faulty metabolism, far-reaching effects of, 1097
Fellows, D. W., "A Few Dental Writers of the Eighteenth Century," 422

Fermentation, 464
Ferris, H. C., on the treatment of nervous patients, 1120
Fifth District (N. Y.) Dental Society, announcement, 1174
Fetid mouth, relief of, 1061
Fetor of the breath, 611
Fifth District Dental Society of the State of New York, announcement, 515, 1067
Filling a disto-oclusal cavity in an upper right second bicuspid, clinic by B. S. Hert, 562
Filling children's teeth with gold, 701
Filling for mummifying pulps, 791
  for root-canals, 508
  ideal, requirements of, 479, 1044
Filling material, choice of proper, 601
  for deciduous teeth, 966
  for dense and non-sensitive teeth, 603
  for dense and sensitive teeth, 602
  for soft and non-sensitive teeth, 603
  for soft and sensitive teeth, 603
Fillings, cement, 505
  correctly inserted, desiderata of, 1167
  gold, cement as an aid in starting, 1171
  metallic, adhesive cement for anchorage of, 431
Filling teeth, has the art progressed in fifty years? 731
  with stanno-percha, a combination of tin and gutta-percha, 112
Film-carrier and indicator for use in making radiographs, 641
Film-holder for use in taking a skiagraph, 679
Fine, Wm. M., "A Method for Producing the Natural Contour of Artificial Teeth on the Lingual and Palatal Surfaces of Artificial Dentures" (clinic), 551
Finishing of fillings, principles governing, 1170
First District Dental Society of the State of New York, proceedings of, 65, 170, 478, 574, 681
  union meting with New York Odontological Society, 568
Fitch, Samuel Sheldon, writings of, 435
Flask, to keep clean, 885
Flask-cleaner, 699
Fleming, Arthur H., "The Perfect Retention for Gold Inlays," 27
Florida Board of Dental Examiners, 519
Florida State Dental Society, announcement, 370, 630
Flux, liquid, formula for, 792
Formaldehyd in the treatment of sensitive dentin, 92
Formalin and tricresol, adverse criticism on, 766
Formalin-cresol dressing, 540
Formic aldehyd, 114
Fox, Joseph, his contributions to dental literature, 434
Fracture of the Mandible from Gunshot Wound (correspondence), 840
Fracture, comminuted, in root of central incisor, case of healing of, 963
  of jaw, first step in the treatment of, 1195
  of jaw, 1195
  of jaws, complications frequently arising in the treatment of, 33
  of maxillary bones, average time required to bring about union, 33
  of maxillary bones, prognosis of, 33
  of the neck of the mandible, 32
Fractured mandible, appliances used in the treatment of, 1196
  complicated cases, 1199
  to take impression of, 1195
Fractured maxilla, treatment of, 1199
Fractures of condyloid process, 32
  of coronoid process, 32
Fractures of the maxillary bones, and *résumé* of forty-three cases, 828
  of the maxillary bones, results to be obtained in treatment of, 829
  of the maxillary bones, treatment of, by wiring, 829
Francis, Chas. S., resolutions on death of, 767
Freeman, Frederic, "The Restoration of the Functions of Mastication, Subsequent to the Removal of Portions of the Mandible, including the Temporo-Maxillary Articulation," 416
Freeman, S., "The Use of Compressed Air in Operative Dentistry," 588
Friedland, M. M., "Shall we Abandon Nitrous Oxid for Ethyl Chlorid or Somnoform?" 835, 1207
Frontal sinus and antrum, relation of, 4
Fuller, Chas. A., obituary of, 1276
Fusing porcelain, method of judging temperature of furnace in the process of, 407

GANGRENE of the mouth (noma), treatment of, 964
Gangrenous stomatitis, 330
Gardette, James, biographical notes on, 998
Gardiner, F. D., report of the Committee on Enforcement of Dental Law (Pennsylvania State Dental Society), 45
Gariot on diseases of the mouth, 434
Gelatinous plaques, formation of, on the teeth, 1037
General and special therapeutics, alcohol in, 252
General Pathological Significance of Pericemental Inflammations (editorial), 956
General practice, comments on, 1179
Georgia State Dental Society, announcement, 518
Georgetown University, Dental Department, commencement of, 898
George Washington University, Department of Dentistry, commencement of, 894
Germicide, iodin as a, 616
Germicides for instruments, 80
Gerrish, C. H., "Outside of Dentistry," 54
Gillett, H. W., on the dentist's treatment of his patients, 1119
Gingival tissues, chloasma traumaticum of, 333
Gingival tissues, recession of, some factors responsible for, 927
Glands of the olfactory and respiratory regions, 1000
Glass, alloys which solder, 506
  use of, for filling teeth, 480
Godon, Chas., "Parallelogram and Polygon of Forces Showing the Factors Involved in the Maintenance and Overthrow of the Articular Equilibrium of the Teeth in the Dental Arches," 748
Gold, a new solvent for, 887
  as a filling material, 151, 1044, 1046
  cohesive and non-cohesive, E. T. Darby on, 427
  condensation of, 427, 671
  discovery of cohesive foil as applied to filling operations, 671
  for filling teeth, first allusion to, 436
  hand pressure for condensation of, 672
  malleted on the ends of teeth, stability of, 771
  melting-point of, 1169
  more force required than for condensation of any other filling material, 671
  non-cohesive, in the gingival third of cavities, 429
  numerous forms of, 671
  "old reliable" positive pressure methods of condensing, 673

Gold, over-condensation of, 672
    permanent teeth of children should be filled with, 1064
    pitting of, 427
    plastic, cause of failure in using, 429
    platinized, for the finishing of fillings, 430
    pure, fusing-point of, 407
    strictly non-cohesive desirable, 433
    tempering, 1064
    tooth-saving qualities of, dependent upon close adaptation to cavity surfaces, 672
Gold-amalgam combination fillings, 604
Gold filling and inlay, comparative merits of, 773
Gold filling, dislodged, replacing of, with cement, 776
    uncertainty of contact in, 768
Gold filling operations, 564
Gold fillings, finishing of, 558
    oxyphosphate as a lining for, 1121
    versus porcelain inlays, 1043
Gold foil, a brief review of the prominent pioneer manipulators of, 389
    cohesive, technique of placing a filling of, 152
    condensing, in tooth-cavities, 671
    for dental uses, date of first manufacture, 435
    non-cohesive, preparation of, 153
    strictly non-cohesive, manipulation of, by the wedging process, W. B. Dunning on, 558
    surface of, should be protected from contamination, 152
    the use of, 557
    value of, as a filling material, 479
Gold inlay, a new feature in the retention of, 563
    hollow, 28
    its advantages over the porcelain one, 615
    matrix for, 28
    method of making, 363
    prevailing method of anchorage with platinum pins, 27
Gold inlays, 768
    advantages of, over those of porcelain, 770
    an easy method of making, 860
    for bridge anchorages; also hood abutments, 721
    for children's teeth, 778
    making of, 772, 778
    retention of, 27
    their application and construction, 1167
Gold operation, clinic by J. V. Conzett, 558
Gold plating, 966
Gold trimmers, 1169
Goldsmith, S. L., on hypnotism and dentistry, 1119
Gomphiasis, 461
Good health, clean teeth and, 117
Graduates, low degree of operative competence frequent in, 1181
Gray, B. Frank, "A Consideration of Some Causes of Malocclusion of the Teeth," 726
Gray, Harry, "Anatomy: Descriptive and Surgical," review of, 497
Green, Jesse C., report of Committee on President's Address (Pennsylvania State Dental Society), 167
Greenwood, Isaac, biographical notes on, 985
Greenwood, John, biographical notes on, 985
Greenwoods, advertisements of, 990
Grinding inlays, how to hold, 116
Gritman, A. DeWitt, "The Regeneration of Dental Prosthesis," 862
Grünwald on the course of the inspiratory air-current, 1000
Guarding the cavo-incisal edges of porcelain inlays with gold, clinic by C. J. Grieves, 843
Guilford, S. H., "Orthodontia or Malposition of the Human Teeth: Its Prevention and Remedy," review of, 610
Guilford, S. H., "The Nomenclature of Orthodontia," 135
Gum, daily massage of, 115
    forcing of, with gutta-percha and cotton tents, 757
    hypertrophy of, 113
Gum recession, mouth-wash for use during treatment of, 928
    on the labial aspect of a tooth, treatment of, 927
    some causes for, 927
    uniform, treatment of, 927
    where the neck of the tooth is free from caries, 928
Gum section, repairing, 361
Gums, hypertrophy of, 1165
    mouth-wash for sore and spongy, 362, 886
    treatment of, before setting crown, 887
Gums and alveolar process, systemic disturbances detected by changes in, 736
Gum-teeth dentures, invisible joints in, 1170
Gum tissue, restoration of, with gum enamel, J. P. Proseus on, 554
Gutta-percha, cases in which it may be used as a filling material, 603
    for cementation of bridges, 1156
    in chloroform, to hasten its solution, 115
Gutta-percha and phosphate cement as tooth-savers, 149
Gutta-percha fillings, finishing of, 1166
G. V. Black Dental Club of St. Paul, announcement, 123, 254, 1067
    clinic before National Dental Association, 564

HALF-BAND crown, 924
Half-collar crown, advantages of, 1231
Hall, Willard, "New Method of Removable Bridge Work," 306
Halogens as antiseptics, 364
Handpiece, how to care for, 616
Hands, disinfection of, 68, 115
Hands and operative accessories, how to sterilize, 968
Hardy, Geo. E., "Amalgam Filling with the Ivory Matrix," 844
Harlan, A. W., "A Review of the Question of the Treatment of Putrescence as Related to Pulps and Pulpless Teeth," 463
    "Restoration of the Gum Tissue on the Labial Aspect of Teeth," 927
Harris, Chapin A., biographical notes on, 392, 425
    contributions to dental literature, 392
Harvard Dental Alumni Association, announcement, 978
Harvard University Dental School, commencement of, 898
Hayden, Horace H., biographical notes on, 391
    and Harris, the pioneers of dental education and professional organization, 994
Head bandage an aid in the treatment of malocclusion, 1014
Head, Joseph, "The Human Skull used as a Gnathodynamometer to Determine the Value of Trituration in the Mastication of Food," 1189
    "The Strength of Porcelain when Used as a Tip or Corner," 130
Heart, disorders and diseases of, in relation to anesthesia for dental operations, 882
Heart murmurs, meaning of, 814
Heating up and soldering, 1063
Heise, Oscar N., obituary of, 1066
Heitzman's denial of the cell theory, 1020
Hemophilia, 1267
Hemorrhage after pulp-removal, hard to overcome, 759
    post-extraction, 70

Hemorrhage, persistent post-extraction, treated by reimplantation, 1162
Hemostatic mixture, 1165
Hemostatic properties of potassium permanganate, 1162
Hereditary syphilis, 329
Hillyer, Ellison, "Correspondent's Report" (New York State Dental Society), 1130
Hinman, Thomas P., "Gold Inlays for Bridge Anchorage; also Hood Abutments," 721
History of dentistry, a proposed, Chas. McManus on, 687
  James McManus on, 688
Hitch, David Marshall, "Tooth-brush Sterilization," 912
Hofheinz, R. H., "The D.D.S. Abroad," 230
Hollow gold inlays, 364
Hoods for bicuspids, 724
Hot air in treatment of pyorrhea alveolaris, 249
How, W. Storer, "Some Phases of Crown and Bridge Work," 290
Howard University, Dental Department, commencement of, 897
Howe, Horace L., "Hyperacidity of the Saliva; Some Causes and Some Effects," 143
Hudson, Edward, biographical notes on, 389
Human jaw, high pressure which it is capable of exerting, 1192
Human jaws, some factors that modify the shape of, 1071
Hunter, John, his contributions to the literature of dentistry, 424
Hutchinson teeth, 329
Hyatt, T. P., "The Teeth and Their Care," review of, 1264
Hydrocyanic acid in the saliva, tests to determine, 1031, 1033
Hydrogen dioxid, the use of, 81
Hydrogen dioxid solution as a bleaching agent, 948
Hydronaphthol in dental operations, 1167
Hydrotherapy and thermotherapy, of value to the dentist, 1193
Hygiene, definition of, 147
  oral, of ancient practitioners, 147
Hyperhidrosis caused by mastication, 249
Hypersensitive dentin, 150
Hypertrophy of the gums, 1165
  a case of, 113
Hypoacid and hyperacid saliva, 1036
Hypodermic needles, to prevent rusting of, 966
  to sterilize, 504
Hypodermic syringe, to keep in good order and the needle from corroding, 1062

Idaho Board of Dental Examiners, 519, 979, 1279
Illinois Board of Dental Examiners, 520, 1068
Illinois State Dental Society, announcement, 716
Immediate root-filling, 1135
Impacted third molar, orthodontia as applied to the extraction of, 1092
Impression, to secure a correct, 1169
Impression bite, how to take, 968
Impression material for cases in which all the teeth are present, 1272
Impression taking, 1064
  a hint on, 116
Impressions for full upper and lower dentures, 869
  partial, how to take, 1171
Incipient pyorrhea, diagnosis of, 617
Incipient stomatitis in the course of mercurial treatment, a simple method of diagnosing, 1162
Incisor, lateral, replacing of, where there are large cavities in central incisors, 725
Indiana Board of Dental Examiners, 123, 1178
Indiana Dental College, commencement of, 799
Indiana State Dental Association, announcement, 371
Infected third molar sockets, 967
Infection, the immediate consequence of microbic invasion, 912
  ways in which it may spread, 139
Infections of the newborn; buccal and salivary, 110
Infectious diseases of the mouth, 328
Inflammation in the vicinity of the lower third molars, 421
Inflammatory conditions of the buccal, nasal, and pharyngeal mucous membranes, rôle of, in the etiology of tubercular infections, 112
Inlay, amalgam, 889
  amalgam, best method of seating, 823
  gold, hollow, 28, 364
  gold, method of making, 363
  gold, to etch the surface of, 887
  porcelain, building of, in layers, 932
  porcelain, cementing, 967
  porcelain, guarding the edges of, with gold, 843
  porcelain, to restore the corner of a central or lateral, 361
Inlay matrix, to remove, 504
Inlay or post-anchorage bridge, forming the cavities for abutments in, 925
  forming the matrix, 926
  hollow inlay should never be used as abutment for, 926
  technique of, 925
Inlays, cavity margins for, 791
  difference in the shade of under-and over-fused, 504
  gold, for bridge anchorages, 721
  gold, how to hold to grind, 116
  gold, retention of, 27
  gold, setting of, 770
  immune to decay, 616
  porcelain, to overcome shadows in, 608
  shading, accurate method of, 506
Inlay shading, problem of, 117
Inlay work, some knowledge of the principles of color formation necessary for success in, 933
In re San Francisco (editorial), 693
Insertion of a labio-cervical porcelain filling, clinic by W. H. Bohn, 606
Institute of Dental Pedagogics, announcement, 371, 1174
Instruments, disinfection of, 700
  for measuring force required to chew food, 1189
  for use in treatment of antral disease, 665
  infected, disturbances caused by, 912
  new mode of sterilizing, 118
  sterilization of, 116, 505
  to remove coating from, after boiling, 1167
  to remove rust from, 80, 249, 792
Intensimetric scale, value of, in recording experiments with the X ray, 642
Intermaxillary elastics in the treatment of maxillary protrusion, 319
Intermaxillary force, its use in correction of malocclusion, 1124
International Dental Federation, commission on military and naval dental service, 513
  notice of meeting, 709
  proceedings of, 100
International Dental Journal (Passing of the) (editorial), 242

Interproximal space, a method of preserving the integrity of, W. R. Clack on, 399, 437
Interstate Dental Fraternity, announcement, 629
Interstitial, meaning of the term, 553
"Interstitial Gingivitis" (correspondence), 553
Investment, how to cool, after soldering, 885 .
Invisible joints in gum-teeth dentures, 1170
Iodin, acute poisoning with, 612
  antiseptic properties of, 142
  as a germicide, 616
Iowa Board of Dental Examiners, 634, 1070
Iowa State Dental Society, announcement, 371, 810
Irregularities, immediate correction of, by the aid of porcelain veneers, 607
Ivory period of prosthetic dentistry, 862

JACKSON, V. H., "A Practical Talk on Orthodontia," 1223
  "Orthodontia," 278
  "Correcting Dental Irregularities by the Jackson System," 1085
Jackson's appliance for tooth-regulation, 1233
Janson, A. K., "A Case of Regulating at Forty," 920
Jarvis, G. O., "Faulty Methods in Teaching and Study of Orthodontia," 743
Jaw, deformities of, how avoided, 1084
  decreases as the brain increases in size, 1201
  development of, normal, may be prevented by inflammatory conditions of deciduous teeth, 1079
  fractured, general symptoms of, 32
Jaw fractures, location and frequency of, 830
  models and appliances, clinic by A. L. Midgley, 555
  résumé of forty-three cases, 830
  simple, treatment of, 1195
  sex and age in relation to, 830
Jaws, appliance for the equalization of, 281
  development of, direction in which it takes place, 726
  equalizing of, Jackson's method, 1090
  fractured, treatment of, 860
  molding and expansion of, 1082
  of an otherwise normal person, usually in typical relation, 1074
Jenkins' prosthetic porcelain as applied to pivot teeth, clinic by W. Clay Middaugh, 195
Johnson, H. Herbert, "Forces Employed in Condensing Gold Foil in Cavities in Teeth," 671
  "Thoughts on the Development of Crown and Bridge Work with Some Practical Suggestions," 285
Jourdain on oral surgery, 434

KANSAS Board of Dental Examiners, 371
Kansas City Dental College, commencement of, 802
Kansas City Dental Society, announcement, 514
Kansas State Dental Association, announcement, 516
Kay, William, obituary of, 973
Kentucky Board of Dental Examiners, 635, 1177
Kentucky State Dental Association, announcement, 371
Kingsley on treatment of cleft palate, 658, 660
Kingsley's splint, 30
Kirk, Edward C., "Chemical Principles Involved in Tooth-Discoloration," 947
  "Pioneer Dentistry in New York; an Historical Study," 981
Kirk, Edward C., "The American Text-Book of Operative Dentistry," review of, 108
  on the significance of the presence of sulfocyanid in the saliva, 1034
Knowlton, F. W., "The Possibilities of Modern Dentistry," 419
Koch's investigations, 1018
Koecker's work, 435

LABORATORY, to deaden noise in the, 118
Lake Erie Dental Association, announcement, 369
Lantern slides demonstrating the use of the X ray, 647-651
LaSalle, Clint W., "A New Porcelain Crown," 146
Latham, Vida A., "Cysts of the Oral Cavity: Ranula," 905
"Layer" shading *vs.* "bulk" shading, 617
Lead, enlarged foramina and perforations treated with, 357
Lead and opium wash, 792
Lecluse on the anatomy of the mouth, 434
Le Cron, D. O. M., "Crown and Bridge Work," 921
  "Porcelain," 406
Le Mayeur, or Lemaire, biographical notes on, 986
Lepage water sterilizer, 34
Lesions of the mouth with which the dentist should be familiar, 651
Leucoplakia, treatment of, 965
Lewis, Henry Martyn (editorial), 349
  notice of death, 244
  obituary of, 366
Lewis and Clark Dental Congress, notice to members, 1057
Liebig, Justus, on fermentations and putrefactions, 1016
  and Schwann, different conclusions arrived at, on fermentations and putrefactions, 1016
Ligature, an effective, 887
Ligatures, twisting, 1166
Light, clinical usefulness and therapeutic efficiency of, 1194
  definition of, 929
  nature of the various rays of, 1194
  relation of color to, 929
  some phenomena of, which assist in producing colors from pigments, 929
  to preserve drugs from the action of, 362
Limit lines of plates and palatal configurations; vacuum chambers, 969
Lincoln Dental College, commencement of, 707
Linhart on mouth-breathing, 1213
Lionesses and other carnivorous animals, results of feeding upon food deficient in lime salts, 655
Lip, cancer of, 329
Lips, frequently an index to constitutional disorders, 652
Liquid flux, formula for, 792
Lister's investigations, 1017
  improved methods in surgery made possible by, 1017
Literature on the accessory sinuses, 858
Livingston (N. Y.) Dental Club, 1175
Local anesthesia, 361
Lower dentures, a point in the retention of, 1273
Local anesthetic, water as a, 887
Lodge band matrix, clinic by E. B. Lodge, 198
Logan, Wm. H. G., on dental X-ray treatment, 646
Long, Eli H., "The Professional Man's Disease," 125
  "The Relation of Circulatory Diseases to General Anesthesia," 813

Los Angeles Association of Dental Alumni, announcement, 123
Louisiana State Dental Association, announcement, 631
Low, F. W., "Report of the Committee on Scientific Research" (Dental Society of the State of New York), 187, 1029
Lower dentures, a point in the retention of, 1273
Luc-Caldwell operation, 11
Luschka's tonsil, description of, 1008
Lymphatic temperament, 461

McAfee, Samuel H., "Removable Backings in Crown and Bridge Work: Another Method," 656
McCall, John O., "A New Bridge Abutment for the Anterior Teeth," 402
MacDonald, Val., "The Position of Dentistry in the Field of Medicine," 154
MacDougall, S. E., "Gold Fillings *versus* Porcelain Inlays," 1043
McKellops, Henry J., biographical notes on, 396
McLaughlin, C. P., "Impaction of the Third Molar and the Use of the Elevator in Its Removal," 421
McLernon, Thos. J., removing broken pins from roots by means of a trephine, 618, 1208
McManus, Chas., "A Proposition for a Dental History," 687
Magnesium sulfate, anesthetic properties of, 613
Magnifying fluoroscope, a new, 640
Maine Dental Society, announcement, 632
Mallet blow and hand pressure, 431
Mal-development maxillary or dental, far-reaching effects, 1203
Malnutrition and malarial symptoms caused by septic conditions in the mouth, 600
Malocclusion, advisability of early intervention, 1123
  associated with mouth-breathing, reasons for the variations in, 1005
  necessity for early treatment of, 1011
  of the permanent teeth, caused by undue retention of the deciduous teeth, 729
  of the permanent teeth, premature loss of the deciduous teeth as a cause of, 726
  of the permanent teeth, some causes of, 726
Mandible, abnormal bilateral growth of, 817
  apparatus to remedy entire loss of, 416
  causes of fracture of, 829
  double fracture of, and its treatment, 1197
  effects of breech presentation in birth upon the shape of, 259
  extensive necrosis of, of tabetic origin, 881
  extensive necrosis and secondary fracture of, of dental origin, 696
  fractured, radiograph of, 272
  fractures of, with slight displacement, treatment of, 829
  misplacement of, at the time of birth, 1075
  obstetrical deformity of, 257
  plastic reconstruction of, 889
  protrusion of, corrected by double resection, 817
  restoration of one-half of, 417
  restoration of, with artificial substitutes, 416
Mandibular action, its influence on the entire system, 457
Mandibular protrusion, characteristic articulation in, 257
  clinic by H. E. Kelsey, 861
  in a man aged twenty-six, correction of, 861
Mandibular resection, double, technique of, 818
Mandrels, worn, 1166
  worn-out, 361
Manipulating a positive matrix for inlay work, 362
Manual training, importance of, 39
Maryland Board of Dental Examiners, 519, 1068
Maryland State Dental Association, quarterly clinic, 841
Maryland State Dental Association and District of Columbia Dental Society, union meeting, 488, 587, 859
Massachusetts Board of Registration, 255, 718, 1070
Massachusetts Dental Society, clinics at, 184
  proceedings of, 53, 182, 1246
Massage and vibration, use of, by the dentist, 1193
Massage of the gum, daily, 115
Mastication, experiments on, by Horace Fletcher, 144
  hyperhidrosis caused by, 249
  influence of, on cerebral circulation, 881
  influence of, upon the teeth, H. C. Smith on, 183
  restoration of the functions of, 416
  thorough, as a means of regaining health, 144
  thorough, in the treatment of chronic diseases, 503
Masticatory value of plates correctly articulated, 313
Match factories, statistics on the condition of the teeth of workmen in, 419
Matrices, a new and valuable method of making, 618
  and their application, H. W. Arthur on, 35
Matrix, for gold inlays, 28
  for pouring a model, 1065
  gold, how to make, 480
  platinum, method of obtaining for cavities reaching under the gum, 483
  the band, 35
  the slip, 36
  the strip, 35
  use of, in filling approximal cavities, 1184
Matrix preparation for cavity extending under the gum margin, 822
  for inlay work, 822
Maxilla, fractured, diagnosis of, 31
  more common causes of, 31
  most common, 829
Maxilla and mandible, changed relations in relative position of, after extraction, 314
  terms preferable for upper and lower jaws, 136
Maxillary antrum, anatomy of, 663
  anatomy of cavities bordering upon, 663
Maxillary bones, fractures of, and *résumé* of forty-three cases, 828
Maxillary fractures, Angle's devices for the treatment of, 31
  most common sequelæ of, 829
  treatment of, by wiring, 30
  treatment of, with Sudduth's splint, 30
  treatment of, with the Hammond splint, 30
  treatment of, with the Hayward splint, 30
Maxillary sinus (antrum of Highmore), empyema of, 1
  radiculo-dental cysts invaginated in, diagnostic significance and treatment of, 961
Measles, early mouth-manifestations of, 330
Measuring the intensity of the X ray, 642
Meats, table of forces necessary for mastication of, with slight trituration, 1191
Medical and dental professions, relations between, 154
Medical College of Virginia, Dental Department, commencement of, 897
Medical features of the Ebers papyrus, 251
Medical practitioner, treatment of odontalgia by, 888

Medico-Chirurgical College, Dental Department, commencement of, 896
Meharry Dental College, commencement of, 796
Melting-point of gold, 1169
Meningitis caused by antrum abscess, 5
Mercurial intoxication caused by an amalgam filling, 112
Mercurial solutions, weak, treatment of thrush with, 113
Mercuric chlorid in hydrogen dioxid, in the treatment of root-canals, 578
Mercury, spilled, how to collect, 504
Mertens, Alex., "A Case of Facial Restoration," 275
Metabolism, as a link between dental surgery and general medicine, 1093
  diseases of, 1095
  meaning of the term, 1095
  oxidation a potent factor in, 1097
Metal dentures with soldered tooth-attachments, 550
Metal spring in orthodontia, 278
Metallic shell inlays, advantages of, 668
  borax as a flux for, 670
  matrix for, 668
  technique of placing, 668
Metals, crown, 758
Method for investing and packing a rubber denture, clinic by H. S. Miller, 197
Method of making soldered gold crowns from one piece of metal, clinic by H. M. Schooley, 846
"Methodical," significance of the term, 505
Methods, faulty, of teaching and study, 743
  of obtunding sensitive dentin, 98
Meyer, John H., "A Combination Plate-Obturator," 916
Miami Valley Dental Society, announcement, 632
Michigan Board of Dental Examiners, 1068
Michigan State Dental Association, announcement, 716, 978
Micro-organisms which cause antral infection, 852
Midgley, Albert L., "Fractures of the Maxillary Bones and *Résumé* of Forty-three Cases," 828
  "Infectious Diseases of the Mouth," 328
Miller, W. D., "Symbiosis, with Particular Reference to the Bacteria of the Alimentary Canal," 528
Mills, W. A., "Chloasma Traumaticum of the Gingival Tissue," 333
Mineral rather than oil stains for correcting color in inlays, 701
Minnesota Board of Dental Examiners, 372, 978
Minnesota State Dental Association, announcement, 370
Mississippi Dental Association, announcement, 518, 810
Missouri Board of Dental Examiners, 519
Missouri State Dental Association, announcement, 371
Mitral stenosis and administration of anesthetics, 815
Mixing amalgam on glazed paper, 1170
Mixing colors in porcelain work, 933
Model, to remove from articulator, 700
Models, advantages of preserving, 1271
Modern crowns and continuous gum work, clinic by D. O. M. LeCron, 555
Modern dentistry, possibilities of, F. W. Knowlton on, 419, 473
Molar, first permanent, influence of, in the anterior part of the arch, 729
  lower third, impacted, radiograph of, 271
  third, impacted, extraction of, 1092
Molar, third, impacted, the X ray in locating, 421
  third, impaction of, elevator in its removal, 421
  upper third, extraction of, with forceps, 422
Molar, anchorage, 723
Molars and bicuspids, incompletely erupted, how to protect the sulci of against caries, 603
Molars, first and second, presence of non-striated muscle fibers in the pulps of, 360
  first, children particularly susceptible to peripheral irritation during period of their eruption, 1204
  fractured upper, 889
Monochloracetic acid as a pulp-canal disinfectant, 250
Montana Board of Dental Examiners, 719
Monthly record of patents relating to dentistry, 124, 256, 372, 520, 636, 720, 812, 904, 980, 1070, 1178, 1282
Morgan, Wm. H., biographical notes on, 397
Moriarty, P. W., "Fractures of the Jaw," 1195
  new splint devised by, for fractured jaw, 1196
Morrison crown, a modification of, 286
Mounting porcelain bridges, 505
Mouth, diseased, bad health resulting from, 148
  disinfection of, 695
  preparation of, for an impression, 1273
  sterilization of, in the treatment of pneumonia, 594
Mouth and teeth, care of, 245
Mouth-breathing, 998
  a factor in the causation of anterior non-occlusion, 317
  conditions associated with, 1210
  consequences of, 1082
  defective bone-development due to, 1001
  every variety of malocclusion may be caused by, 1003
  injurious results of, 998
  not always a habit, 1005
  operation to remedy malocclusion caused by, 1011
  phonation seriously impaired by, 999
  predisposing causes, 1210
  vacant expression of the face caused by, 998
Mouth-conditions, diagnosis of systemic disturbances through, 1098
Mouth-mirror, necessity for sterilizing, 1064
  value of, 1272
Mouth-washes, antiseptic, 363, 1269
  feeble sterilizing influences of, 701
Mouton on dental prosthesis and prophylaxis, 434
Mummifying agents in dental practice, 118
Mummifying root-canal filling, 791
Muscles of the lips and cheeks, their influence on the shape of the arch in mouth-breathers, 1005
Muscular force in relation to proper tooth-development, 1201
Myer's pressure syringe, objections to, 92
Mylo-hyoid muscles, anatomical arrangement of, 1080

NARROW fissure, square-end bur to be used in, 700
Nasal obstruction, catarrh a sequelæ of, 1001
  eye and ear troubles commonly associated with, 1002
  observation of early symptoms of, 1011
Nasal respiration, obstructed, bad effects of, 1001
Nasal septum, position occcupied by, in the normal subject, 1005
Nasal source of antral infection, 851
Nash, B. C., on oral prophylaxis, 89

Naso-pharynx, anatomical structure and physiological function of, 999
National Association of Dental Examiners, announcement, 369, 1277
National Association of Dental Faculties, announcement, 626
National Capital Dental Society, announcement, 123
National Dental Association, proceedings of, 200
  Section I, proceedings of, 307
  Section II, proceedings of, 426
  Section III, proceedings of, 453
  clinics at, 554
  Committee on History of Dentistry, notice from, 352, 368
  election of officers, 1176
  program of tenth annual session, 711, 900
  report of Committee on History, 208
  report of Committee on President's Address, 238
Nebraska Board of Dental Examiners, 636, 1176
Nebraska State Dental Society, announcement, 516, 811
Necrosis of the jaws, treatment of, 246
  of the mandible, of tabetic origin, 881
Negroes, why they have such white teeth, 1268
Neuralgia caused by impacted third molars, 592
  etiology of, 591
  trigeminal, differential diagnosis of, 791
Neuralgia and neuritis, 506
  differential diagnosis by the X ray, 639
Neuridin, 538
"Neurocaine," 761
Newborn, buccal and salivary infections of, 110
New England Association of Dental Examiners, announcement, 632
New feature in the retention of gold inlays, clinic by Ira J. Coe, 563
New fusible cement, a, clinic by F. E. Roach, 196
New Hampshire Board of Registration, 519, 1069
New Hampshire Dental Society, announcement, 122
New Jersey Board of Registration, 519, 720, 1069
New Jersey State Dental Society, announcement, 518, 716, 1068
New method of adjusting a porcelain crown as suggested by Dr. I. C. Curtis, Fulton, N. Y., clinic by W. A. White, 557
New Orleans College of Dentistry, commencement of, 803
New root-preparation for a porcelain crown, clinic by M. C. Tracy, 196
New York College of Dentistry, class of '96, 516
  commencement of, 896
New York dentists, part played by, in development of dentistry, 996
New York Odontological Society, proceedings of, 675, 767, 862, 1109
  union meeting with First District (N. Y.) Dental Society, 568
New York State Dental Society, announcement, 254, 515
  proceedings of, 187, 1023
Nitrogen-fixing bacteria, 530
Nitrous Oxid and Ethyl Chlorid (correspondence), 1207
Nitrous oxid and oxygen, 836
Nitrous oxid anesthesia, characteristics of, 836
  contra-indicated in arterial disease, 815
  duration of, 836
  how to overcome asphyxia induced by, 816
  mortality rate of, 838
  safety of, 836
  two fatalities under, 835
Noise in the laboratory, to deaden, 118
Noma, etiology of, 1269
Nomenclature of orthodontia, C. S. Butler on, 240
Non-occlusion, 317
Non-striated muscle fibers in the pulps of the first and second molars, 360
North Carolina Board of Dental Examiners, 634
North Carolina State Dental Society, announcement, 715
North Dakota Dental Association, announcement, 371
Northeastern Dental Association, announcement, 978
  president's address, 688
  proceedings of, 683
Northern Illinois Dental Society, announcement, 977
Northern Indiana Dental Society, announcement, 977
Northern Iowa Dental Society, announcement, 977
North Nebraska Dental Association, announcement, 369, 1067
North Pacific Dental College, commencement of, 895
Northwestern University Dental School, announcement of annual clinic, 122
  commencement of, 893
Nose, artificial, 275
Novocain, a new anesthetic, 882
Nutrition and repair, 458
Nyman, J. E., "The Status of the Profession," 1214

OBSTETRICAL deformity of the mandible, 257
Obstructions to nasal breathing, 1005
Obtaining plaster casts of the face, 615
Obtundents for dentin, 505
Obtunder, automatic, 760
  for sensitive dentin, 792
Obturators for correction of cleft palate, 660
Occlude, etymology of the word, 137
Occlusion, correct, on one side of the face and not on the other, a case of, 1090
  ideal, of the teeth in the human jaws, 302
  meaning of the term, 867
  normal, the same in civilized and uncivilized people, 303
  plea for a proper appreciation of, 684
  so-called perfect, not essential to proper mastication, 1190
  the basic principle of orthodontia, 684
  type which prevails in all savage tribes, 25
Odontalgia, remedy for, 1062
  treatment of, by the medical practitioner, 888
  Valsava's treatment of, 423
Odontotechnique Society of New Jersey, announcement, 255
Ohio Board of Dental Examiners, 635, 1069
Ohio College of Dental Surgery, commencement of, 705
Ohio Medical University, Dental Department, commencement of, 803
Ohio State Dental Society, announcement, 123, 1174
Oil colors as an aid in porcelain work, 941
Oklahoma Board of Dental Examiners, 519, 1069
Oklahoma Dental Association, announcement, 515
Old and new way of constructing porcelain shell crowns, clinic by G. W. Cochran, 199
Oliver, Robert T., "Three Years' Service in the Philippines," 208
Open-bite malocclusion, associated with mouth-breathing, 1003
  treatment of, 318
Open-face crown, method of making, 747

Oral and dental hygiene, clinic by Wm. Conrad, 559
Oral cleanliness, is it the chief factor in the prophylactic treatment of caries? 1100
Oral conditions essential to bacterial activity, 1101
Oral hygiene, some modern thoughts along the line of, 147
Oral prophylaxis, 90
Oral secretions, 116
Oral sepsis, J. E. Power on, 593
Oral surgery, G. Lenox Curtis on, 77
Original method of obtaining perfect adaptation to the root in crown work, clinic by A. L. Haas, 562
Original method of tipping porcelain teeth for bridge work, clinic by G. A. Bowers, 555
Orthodontia, a practical talk on, 1233
  a well-established specialty, 936
  etymology of the term, 136
  nomenclature of, S. H. Guilford on, 135
  question of extraction in, C. S. Case on, 373, 521
Orthodontia appliance, clinic by F. B. Hicks, 185
  to electro-gild, 888
Orthodontia technique as applied to tooth-extraction, case illustrating, 1092
Orthodontist, the children's doctor, 1011
Osmic acid in the treatment of trifacial neuralgia, 1058
Osteoclasts in dental caries: process of tooth-destruction at the carious zone, 358
Osteoma of the hard palate, 73
  of the mandible, 78
Ottolengui, R., on the dentist's treatment of his patients, 1117
Outside of dentistry, C. H. Gerrish on, 54
Over-bite, extreme, causes of, 318
  treatment of, 318
Oxyhydrogen blowpipe, advantages of, in high-class crown and bridge work, 657
Oxyphosphate, lining cavities with, previous to insertion of gold fillings, 1121

Pain following removal of pulp under pressure anesthesia, 763
  post-extraction, 70
Palate, hard, osteoma of, 73
  to diminish the sensitivity of, prior to taking plaster impressions, 616
Palates, sensitive, treatment of, prior to taking plaster impressions, 886
Paraform in the treatment of root-canals, 468, 583, 1136
Parasitism, 528
Parkhurst, Jabez, and Wm. H., biographical notes on, 994
Parsons on the etiology of influenza, 1206
Partial dentures, use of vertical clasps for their retention, 357
Partial impressions, how to take, 1171
Passing of the *International Dental Journal* (editorial), 242
Pasteur's investigations on fermentations, 1016
"Pâte d'Argent," Taveau's, 435
Pathology of dentistry, 1243
  methods of teaching the, 737
Pavy on pathologic metabolism, 1096
Peck, A. H., "Ethics," 409
Pennsylvania Board of Dental Examiners, 634, 1279
Pennsylvania College of Dental Surgery, commencement of, 799
  notice to alumni, 1174
Pennsylvania State Dental Society, announcement, 714
  clinics, 605
  election of officers, 169
  proceedings of, 38, 158, 1142, 1175, 1228
  report of Committee on Oral Hygiene and Public School Dental Education, 1245
People's Dental Journal, Allport, editor of, 395
Perfectly swaged cusps, 1271
Pericemental inflammations, general pathological significance of, 956
Pericementitis, treatment of, 963
Pharynx, tissues of, and vessels of the foramen lacerum medium, close relationship between, 1010
Phenol-sulfonic acid in the treatment of root-canals, 465
Philadelphia Dental College, Alumni Society, 629
  commencement of, 798
Philippines, dental base stations in, 210
  dental law in, 220
  dental legislation in, 221
  dental surgeons in, 209
  tables showing services rendered by dental surgeons in, 218
  three years' service in, 208
Physical therapeutics, subjects included in, 1193
Physicians should possess some knowledge of dentistry, 154
Picric acid in dental therapeutics, 884
Pin-plate bridge, 291
Pins, removing from roots, 618
Pioneer dentistry in New York: an historical study, 981
Pioneer dentists, ethics of, should be judged in the light of their time, 997
Pittsburg Dental College, commencement of, 897
Pivots, wood, 285
Plant symbiosis, 530
Plaster, how to color, to facilitate separation, 504
Plaster cast and impression, preparation of, prior to waxing-up, 616
Plaster casts, a good coating for, 362
  coating for, 885
  hard, to make, 885
  of the face, method of obtaining, 615
  to harden and protect, 504
Plaster models, duplicating with gelatin, steps in the process, 365
Plastic reconstruction of the mandible, 889
Plate, to obtain outline of, 115
Plate-obturator, a combination, 916
  devised by Paré in 1541, 916
  mode of constructing, 916
  taking impression for, 916
  usefulness of, 919
Plates, final polishing of, 361
  metal, early methods of finishing, 862
  metal, points to be considered in making, 866
  temporary, bad results of wearing them too long, 868
Platinum, pure, fusing-point of, 407
Platinum base, constructing a crown with a facing upon, 702
Platinum foundation for a porcelain bridge, 1099
Platinum-gold combination fillings, 605
Pneumococcus frequently harbored in normal mouths, 1206
Pneumonia organisms in healthy mouths, 596
Poisoning, general rules in, 1063
Polishing and grinding stones, to sterilize, 699
Polishing Ground Surfaces of Porcelain Teeth (correspondence), 934
Porcelain almost unlimited in its application, 1046
  as a filling material, 91, 1045

- Porcelain cavities in which its use is contra-indicated, 508
  - chemical analysis of, 408
  - compressed and non-compressed,, less resistance of the former to percussion and shear strength, 133
  - durability of, dependent on its quality, 1098
  - fusing of, J. Q. Byram on, 554
  - high- and low-fusing, relative strengths of, 483
  - high-fusing, most suitable for bridge work, 1098
  - how to prevent bubbles in, 887, 890
  - in dentistry, W. B. Dills on, 479
  - in large cavities, utility of, 1274
  - introduction of, in America, 435
  - merits and demerits of, 823
  - metallic oxids used for the coloring of, 409
  - method of estimating the temperature of the furnace during fusing of, 407
  - of various makes, resistance of, to percussion, 133
  - preparation of cavities not subject to occlusal stress, 821
  - protection for, during soldering, 886
  - resistance of, to shear force, 131
  - retention of, 823
  - strength of, when used as a tip or corner, 130
  - to obtain various shades of, by mixture of the basal colors, 942
  - why it should be fused at the correct temperature, 407
- Porcelain art, clinic by Stephen Palmer, 607
- Porcelain body, application and baking, 924
- Porcelain bridges, advantages of, 1098
  - durability of, dependent on baking of the porcelain, 1099
  - mounting, 505
  - prosthetic technique of, 1099
  - with and without a platinum foundation, building of, 1099
  - without the removal of the pulp, 1098
- Porcelain bridge work, difficulties encountered in, 1232
- Porcelain crown, a new, 146
  - advantages of, 922
  - construction of, 554, 922
  - for molars and bicuspids, an easily constructed, 156
  - or any porcelain tooth that has been ground, to polish, 966
  - thermal changes but slightly conducted by, 1051
  - to polish, 966
  - to prepare the floor of a cap for, 699
  - where indicated, 922
- Porcelain-face crowns, 1149
- Porcelain inlay, simple, effect of percussion on the surface of, 134
- Porcelain Inlays—Brewster bodies, Turner furnace, clinic by C. E. Abbott, 186
  - G. T. Banzet on, 554
  - cavity preparation in, 1025, 1048
  - cementation of, 1026
  - color problem in, 1024
  - from impressions, 481
  - guarding the edges of, with gold, 843
  - importance of a decided seat for, in cavities, 1059
  - point of contact, 1051
  - retention of, 509
  - shading of, 1049
  - to obtain a roughened surface for, 361
  - to overcome shadows in, 607
  - white lining for, 1028
  - with special reference to cavity formation, 821
- Porcelain inlay work, cement the chief factor of color problem in, 931
  - colors concerned in, 930
  - colors of the teeth in relation to, 932
  - foundation body for, 933
  - matching tooth-colors in, 931
  - mixing colors in, 933
  - oil colors as an aid in, 941
  - purity of color in, dependent upon accuracy of fusing, 933
  - selection of colors for, 702, 932
  - the shadow problem in, 932
- Porcelain inlay worker, study of color formation by, 1025
- Porcelain pin-facings, disadvantages of, 1151
- Porcelain powder should not be mixed too thin, 1026
- Porcelain strain while backing teeth, to relieve, 616
- Porcelain teeth, backing facings and gold corners on, 888
  - for bridge work, method of tipping, 555
- Porcelain tests by Dr. Jenkins, 131
- Porcelain tips, comparative strength of, 130
  - with pins, 771
- Porcelain veneers for immediate correction of irregularities, 607
- Poree, Hamilton, Dubuke, Fisher, Dustwige, early dentists, biographical notes, 985
- Porosity in vulcanite, how to avoid, 1170
- Porto Rico, dental law for, 120
- Post, removable, as fast and strong as an irremovable one, 1192
- Post-extraction treatment of the alveoli, 613
- Post-occlusion, 138
- Post-oral suppurative conditions, 654
- Potassium chlorate, fatal intoxication with small doses, 359
- Potassium iodid in the treatment of pericemental infection, 541
- Potassium permanganate as a hemostatic, 887, 1162
- Potassium sulfocyanate as a nerve sedative, 1030
- Potter, W. H., "The Need of Endowment for Dental Schools," 1246
- Power, James E., "Oral Sepsis," 593
  - "Oral Surgery," 65
  - "The Importance of Early Recognition of Epithelioma," 56
- Practical hints, useful, 361
- Practical method of paralleling bridge abutments without devitalization, clinic by H. Phillips, 860
- Precipitated chalk, to test the purity of, 618
- Preiswerk, Gustav, "Atlas and Epitome of Dentistry," review of, 1261
- Preparation of cavity, 116
  - of plaster cast and impression prior to waxing up, 616
- Pressure anesthesia, 90
  - J. J. Cantwell on, 759
- Preventive for rust, 504
- Price, Weston A., on the therapeutic application of the X ray, 645
- Primrose, Frederick, "Extensive Bridging after Pyorrhea," 335
- Problem of inlay shading, 117
- Professional man's disease, the, 125
- Professional organization, beginnings of, 995
- Prognathism and orthognathism, 137
- Proper closure, to secure, 361
- Prophylaxis, 89
  - writings of Mouton on, 434
- Prosthesis, definition of, 921
  - more attention to manual training necessary to raise the standard of, 921

Prosthesis, regeneration of, 862
Prosthetic apparatus to supply lost tissues of the nose and lip, 275
Prosthetic dentistry, ceramic age of, 862
  ivory period of, 862
  possibilities of, 863
Prosthetic specialist, increasing demand for the, 1074
  must base operations upon a knowledge of comparative anatomy, 1074
  should be familiar with pathological conditions responsible for facial inharmony, 1074
  the great need for, 937
Protection for facings, 699
Proteid putrefaction, 538
Protrusion, extreme upper, with receding mandible, Jackson method of treatment, 282
  lower, extreme case of, 380
  mandibular, 861
  mandibular, unnatural relation of the jaws in, 358
Psi Omega Dental Fraternity, announcement, 714
Psoriasis of the tongue, 58
Ptyalin, action of, upon starch, 534
  immediate action of, 532
Public Dental Library for Columbus, Ohio, 1281
Pullen, Herbert A., "Mouth-breathing," 998
Pulp, devitalization of, by means of arsenic in combination with cocain and formaldehyd paste, 764
Pulp-canal disinfectant, monochloracetic acid as a, 250
Pulp-capping, 786
Pulp-decomposition, 580
Pulp-extirpation, 1062
Pulp-removal under pressure anesthesia, conditions to be guarded against, following, 759
Pulps, live, removal of, under cocain anesthesia, 91
  of loose teeth, removal of, 775
  putrescent, treatment of, 537
Pulp tissue, chemical constituents of, 538
Pure gold and cement, tenacity between, 669
Pus in the post-oral parts, dangers of, 654
Putrescence as related to pulps and pulpless teeth, treatment of, 466
Putrescent pulps and their sequelæ, rational treatment of, 537
  solidified formaldehyd in the treatment of, 614
Putrescent root-canals, drainage of, 1135
  successfully treated with tricresol and formalin, 1137
Putrescin, 465, 538
Pyorrhea alveolaris, 503
  compressed air in the treatment of, 589
  continued mild medication in the treatment of, 250
  extensive bridging in the treatment of, 335
  hot air in the treatment of, 249
  increasing tendency to, 91
  local treatment of, 888
  obscure etiology of, 473
  permanent cure of, by the X ray, 644
  relation of, to uremic disturbances, 828
  remedies for, 117
  treatment of, by the X ray, reports upon, 644
  treatment of, with common salt, 1168
  views of Robert Arthur on the unfavorable prognosis of, 827

RADICAL operation through the facial wall, 11
Radiculo-dental cysts invaginated in the maxillary sinus: diagnostic significance and treatment, 961
Radiograph of alveolar abscess, 264, 265
  of fractured mandible, 272
  of fractured maxilla, 273
  of impacted lower third molar, 271
  of impacted upper left canine, 272
  of impacted upper right canine, 271
  of incarcerated germs of upper bicuspids, 272
  of normal oral tissues, 263
  of typical case of pyorrhea, 273
Radiographs, methods of making, 640
  obtained by antero-posterior exposure, advantages of, 642
  of abscesses upon the sides of roots treated by curetting, 24
  of chronic alveolar abscess, involving the apices of the canine and first bicuspid roots, 20
  of chronic alveolar abscess of fifteen years' standing, 20
  of extensive abscess upon three teeth, 21
  of the head: stereoscopic pictures, 641
  showing abscess upon anterior root of crowned lower first molar, 23
  showing incipient abscess upon root of crowned bicuspid, 19
  showing unsuccessful attempt at root-amputation, 23
Radium rays, peculiar effect of, 287
Ranula, congenital, in the newborn, a case of, 909
  definition of the term, 905
  not always a dilatation of Wharton's duct, 906
  wisdom of adopting a uniform meaning for the term, 906
Ranulæ, character of the encysted fluid of, 906
  differentiation of, 906
  most common occurrence in various ducts in order of frequency, 906
  origin of, 906
  treatment of, 909
  true, two forms of, 909
  usually retention cysts due to obstruction of a duct, 906
Ranulæ and bursæ, rules for the treatment of, 909
  bibliography on, 911
Rays from the X to the Hertzian, wave-length of, 260
Readily-made matrices and their application, H. W. Arthur on, 35
Recent Fatality (The) Under Anesthesia: a Correction (correspondence), 934
Reciprocity or interstate dental licenses, 206
Refrigerant, dental, 562
Regulating, a case of, at forty, 920
  technique of, 920
Removable and stationary bridges, clinic by F. L. Fossume, 859
Reimplantation, persistent post-extraction hemorrhage treated by, 1162
Removable backings in crown and bridge work: another method, 656
  investment for, 657
  technique of placing, 656
Removable bridge work, clinic by A. J. Sawyer, 184
Removable Bridge Work: New Method of (correspondence), 306
Removable post devised by Chas. Taylor, 1192
  easy removal of, 1192
  technique of placing, 1193
  to perfect the joint in, 1192
  to reduce the size of, 1192
Removal of an inlay matrix, 504
Removing Pins from Root-canals (correspondence), 1208
Removing pins from roots, 618

Reoch, Norman G., "A Plea for a Proper Appreciation of Occlusion," 684
Repairing gum sections, 361
Repairing or adding teeth to a plate, 361
Repeating Tendency, The, in Dental History (editorial), 104
Replacing a tooth on a vulcanite plate, 362
Replantation, a case of, 890
    of teeth, 502
    of tooth with a fractured root, clinic by F. S. Andrews, 185
Replantation and transplantation practiced by Fauchard, 424
Report of Committee on Practice (New York State Dental Society), by A. L. Swift, 87, 93
Research, dental, a plan for carrying on, 846
Resection of a portion of a root in the treatment of chronic alveolar abscess, 698
Resetting an upper denture when the bite is satisfactory, method of, 118
Restoration of gum tissue on the labial aspect of teeth, 927
Re-striking-up a plate, to save time when, 360
Rice on mouth-breathing, 1211
Rhode Island Board of Registration, 635, 979, 1176
Richmond crown, construction of, 1149
    essential features of, 293
    historical item on its early use, 286
    removable, 285
Roe, John O., on antral empyema, 850
Rogers, A. P., on treatment of malocclusion, 685
Root, decayed below gum margin, crowning of, 556
    method of obtaining perfect adaptation to, in crown work, 562
Root-amputation, after-treatment, 41
Root-canals, a method of removing broken pivots from, 890
    filling of, 1063
    filling with gold, origin of the method, 391
    infected, S. G. Perry on the treatment of, 584
    material for filling, 508
    method of lining with chloro-percha, 1122
    treatment of, 886
    treatment of, a review of the question, 463
Root-canal treatment, 466, 580
Root-extraction, facial paralysis following, 356
Root-fragment in the gum, inflammation resulting from, 270
Roussel, Geo. A., "Theoretical and Practical Treatise on Crown and Bridge Work," review of, 354
Royal College of Dental Surgeons of Ontario, commencement of, 705
Rubber, packing, 361
    shrinkage in, during vulcanization, 886
Rubber dam, originator of, 394
    use of, in setting bandless crowns on anterior teeth, 561
    use of, not always essential in cavity preparation, 1184
Ruhmkorf coil, excitation of the X-ray tube with, 638
Rubber plates, to polish, 1166
Rust preventive, 504
Rust, to remove from instruments, 80, 249

Saddle bridge, 291
Saddle four-stop bridge, 291
Saddle nose, transplantation of bone for the relief of, 116
Saddle two-stop and pier-post bridge, 291
St. Louis Dental College, Alumni Association, 370
    commencement of, 804
St. Louis Dental Society, announcement, 1174
St. Louis Society of Dental Science, announcement, 810
Sajous, on the "adrenal system," 1008
    on the co-ordinate functions of the anterior and posterior pituitary bodies, 1009
    on the posterior pituitary body, 1010
Salicylic ionization in an obstinate case of tic douloureux, 363
Saliva, changes in, from the hypoacid to the hyperacid state, 1036
    constitution of, in relation to caries and erosion, 190
    dental caries and the nature of, 357
    functions of, 460
    hyperacidity of, J. P. Corley on, 455
    hyperacidity of, some causes and some effects, 143
    normal reaction of, 143
    over-acid, effects of, 145
    proportion of water in, 1029
    sulfocyanates in, relation of, to the solubility of gelatin, experiments to determine, 1029
    tests with, 190
    to control, 505
Saliva and tooth-polishing powders, to prevent from working back into the handpiece, 886
Salivary calculi, Fauchard on the formation of, 423
Salivary lithiasis, two cases of, 245
Salter, Geo. Bell, obituary of, 972
San Francisco Dental Relief Fund (editorial), 877
Satterlee, Francis LeRoy, "The X Ray in Dentistry," 260
    on the application of X-ray science in dentistry, 644
Sauce, The, to the Pudding (editorial), 1053
Saunders, Wm., obituary of, 972
Scarlet fever, early mouth-manifestations of, 331
Schamberg, M. I., "The Surgical Treatment of Chronic Alveolar Abscess," 15
    "The Uses of the X Ray in Dentistry" [abstract], 591
    on treatment of pyorrhea with the X ray, 646, 679
    X-ray demonstration by, 1237
Schmitt, M. L., on treatment and cure of pyorrhea with the X ray, 646
School children's teeth, report on the condition of, 963
Schroeder's cotton filter, its influence on concepts of putrefaction, 1017
Schwann's microscopic studies of the alcoholic fermentative processes, 1016
Science, new truths of, continually discovered, 1015
    place of the imagination in the study of, 1042
Scientific investigation, consideration of evidence in, 1015
    E. C. Kirk on, 1041
Scopolamin-morphin anesthesia, deaths during, 886
"Screen for soft rays" used in X-ray work, 643
Screws *versus* springs, in tooth-regulation, 1126
Secondary dentin, John Hunter on, 425
Second District (N. Y.) Dental Society, announcement, 122
Sensitive cavities, successful treatment of, 1271
    method of obtunding, 615
    obtunder for, 792
Sensitive dentin, a remedy for, 92, 115
Sensitive palates, treatment of, prior to taking plaster impressions, 886

Sensitiveness at necks of teeth, treatment of, 92
Sensitivity of the palate, to diminish prior to the taking of plaster impressions, 616
Separating varnish, 361
Septum, deflected, operation for straightening, 1006
Setting of impression plates, to hasten, 1167
Setting of inlays, 770
Seventh and Eighth District Dental Societies of the State of New York, announcement, 1067
  proceedings of, 751, 850, 935, 1043
Seventh District (N. Y.) Dental Society, announcement, 369
Shades of over- and under-fused inlays, difference between, 504
Shades, selecting, 885
  selecting of, in porcelain inlay work, 702
Shading inlays, accurate method of, 506
Shallow erosion cavities, treatment of, 504
Shell and band crowns, disadvantages of, 507
Shell crowns, 1149
Sherwood, J. A., "Cavity Preparation and the Shading and Setting of Inlays," 1048
Shock, surgical, the prominent factor in, 814
Significance of the term "methodical," 505
Signs of degeneracy, 880
Silver foil, clinic by Langdon S. Chilcott, 561
  for filling teeth, 561
Silver-nickel for regulating purposes, 1086
Silver nitrate, antidote for, 1271
  as a preventive of decay, 363
  effectiveness of, in treating sensitiveness at the necks of teeth, 927
  ten per cent. solution in the treatment of surfaces of teeth and gums, 560
  with cement fillings, 362
Similarity in tooth tissue of children and adults, 700
Sinuses, accessory, literature on, 858
Sinusitis, chronic suppurating, 856
Sixth District Dental Society of the State of New York, announcement, 1067
Skinner, R. C., biographical notes on, 989
Skulls, examination of a number, 25
  examination of a series of fifteen hundred, 474
Smith, Guy Vinton, "Porcelain Bridges Without Removal of the Pulp," 1098
Soap, antiseptic liquid, formula for, 35
Sockets, infected, of third molar, 967
Sodium and potassium compound, an aid in prevention of tooth-discoloration, 950
Sodium dioxid, explosion with, 359
Sodium dioxid, chlorin, and hydrogen dioxid, relative capacity for bleaching the hematin stain, 948
Soft soldering, 885
Solder for use with glass, 506
  to restrict the flow of, 361
Soldering, 701
  a hint about, 886
  how it was accomplished in 1840, 862
  of aluminum, 115
  to achieve success in, 926
  to direct the flame in, 885
Solenberger, A. R., "Empyema of the Maxillary Sinus," 661
"Solidified formaldehyd," 1136
  in the treatment of putrescent pulps, 614
Somnoform, composition of, 839
  death under, 839
  its use in dentistry, 1021
  properties of, 839
  signs of complete anesthesia with, 839
Sore tooth, to support, while drilling, 1271
South Carolina Board of Dental Examiners, 634
South Carolina State Dental Association, announcement, 631, 978
South Dakota Board of Dental Examiners, 123, 720, 1278
South Dakota State Dental Society, announcement, 632
Southern Dental College, commencement of, 801
Southern Dental Society of New Jersey, announcement, 629
Southern Nebraska Dental Society, announcement, 1068
Southern Wisconsin Dental Association, announcement, 515
Speed, question of, in dental operations, 1183
Spilled mercury, how to collect, 504
Splint, Gunning's vulcanite interdental, 30
  Hammond, in the treatment of maxillary fractures, 30
  interdental, vulcanite or metal, 130
  vulcanite, indications for the use of, 829
Splints, interdental, vulcanite and aluminum, 829
Spring, metal, in orthodontia, 278
Springs, proper use of, in prosthetic orthodontia, 1125
Square-end bur for use in narrow fissures, 700
Stages in salivary semeiology, 191
Stainton, Chas. S., obituary of, 794
Stanley, N. A., "An Easily Constructed Porcelain Crown for Molars" (clinic), 156
Stanno-percha; a combination of tin and gutta-percha for filling purposes, 112
Staphylorrhaphy, when it should be practiced, 659
State Dental College, Texas, commencement of, 798
State University of Iowa, College of Dentistry, commencement of, 895
Steel instruments, fine, tempering, 117
"Steele" facings for crown and bridge work, 1151
Steno's duct, 80
Sterilization of instruments, 116, 118, 505, 1168
  of instruments used upon the hard tissues of the teeth, 913
  of polishing and grinding stones, 699
  of solutions of cocain hydrochlorid, 111
  of the hands, 68, 115
  of the hands and operative accessories, 968
  of the mouth, importance of, prior to abdominal operations, 736
  of water, Lepage apparatus for, 34
Stereoscopic pictures of the teeth, 273
Stereoscopic radiographs, a knowledge of the technique necessary for taking, 642
Stiller, B., on phthisis, 1205
Stolte, Herman, "Etiology and Treatment of Acute and Chronic Empyema of the Antrum of Highmore," 1
Stomatitis, antiseptic mouth-washes for use in, 698
  gangrenous, 330
  herpetica, 331
  in children, 789
  treatment of, 71
  treatment of, with the aid of compressed air, 588
  ulcerosa, 331
Students, bad mental habits of, 744
Sublingual and submaxillary cysts, differentiation between, 907
Sublingual and submaxillary glands, anatomy of, 908
  obstructed, description of growths resulting from, 908
Sublingual cysts, various opinions on the origin and nature of, 907

Submaxillary and sublingual glands, calculus in Wharton's duct complicated by suppuration with involvement of, 358
Sulfocyanids, effects of, on the human system, 1037
Supernumerary teeth, study of, by the aid of the X rays, 639
Suppuration, general origin of, 139
Surgeon, preparation of, prior to operating, 596
Surgeons, conservatism of, in regard to instruments, 155
Surgical burs, 16
Surgical infections, treatment of, 117
Surgical treatment of alveolar abscess, clinic by M. I. Schamberg, 197
Swift, A. L., report of Committee on Practice (New York State Dental Society), 87
Symbiosis, definition of, 528
  triangular or tripartite, 530
  with particular reference to the bacteria of the alimentary canal, 528
Symptoms of alveolar abscess, constitutional and local, 617
Syphilis, clinical manifestations of, 328
  early tertiary manifestations of, 653
  hereditary, 329
  of the maxillæ, in its relation to diseases of the dental organs, 696
  primary lesion, 328
  secondary manifestations, 329
Syphilitic, dental irregularity in a, 961
Syphilitic endarteritis, 126
Syphilitic gumma, 329
Syphilitic ulcer of the mouth, 58
Syringe, high-pressure, for pulp-removal, 761

TAFT, JONATHAN, biographical notes on, 397
Talbot, Eugene S., "Developmental Pathology," review of, 355
  "Errors in Dental Education," 731
Talc supports, use of, in fusing porcelain, 1166
Taveau's "Pate d'Argent," 435
  "Hygiene de la Bouche," 435
Taylor, Chas., "A Removable Post as Fast and Strong as an Irremovable One," 1192
Taylor, Levi C., "Some Modern Thoughts along the Line of Oral Hygiene," 147
Teaching and study, faulty methods in, 743
Teeth, amount of pressure they are capable of exerting, 1045
  artificial, a method for reproducing the natural contours of, in dentures, 551
  artificial, carving of, 870
  artificial, how to articulate, 868
  artificial, normal articulation of, 311
  artificial, old method of attaching to gold or silver plates, 862
  artificial, to replace on vulcanite plate, 362
  care of, during pregnancy, 886
  children's, necessity of educating people to a proper appreciation of the value of, 729
  cleaning of, 600
  conspicuously discolored, porcelain veneers to restore uniformity of shade, 607
  cracking of, in soldering, 1063
  deciduous, importance of proper care of, 1079
  deciduous, inflammatory conditions in, may prevent normal alveolar development, 1079
  deciduous, premature loss of, cause of malocclusion of the permanent teeth, 726
  deciduous, serious consequence of premature loss of, 1079
  deciduous, their influence on the shape of internal face structures, 1078
Teeth, deciduous, undue retention of, as a cause of malocclusion of the permanent teeth, 729
  devoid of enamel, 788
  diseased, that might cause empyema, 6
  effect of coarse food upon, 1243
  elongated, production of, 1083
  extracted, tabulation of 3000, 962
  filling cavities in, with tooth-structure of animals, 480
  for bridge work, method of tipping, 555
  implanted, investigations on consolidation of, 1058
  in the dental arches, factors involved in the maintenance and overthrow of the articular equilibrium of, 748
  in the human jaws, is there an ideal occlusion of? 24
  irregularity of, Chapin A. Harris on the most frequent cause of, 726
  Jackson's system of regulating, 841
  may change from "soft" to "hard," and *vice versa*, 1102
  of children, gold inlays for, 778
  of school children, report on the condition of, 963
  of workmen in match factories, statistics on the condition of, 419
  permanent, of children, fill them with gold, 1064
  permanent, some disturbing factors which produce structural alterations of, 1075
  relation of, to dento-facial harmony, 373
  separation of, in porcelain work, 1050
  temperamental characteristics of, 506
  upper molar, fractured, 889
  vascular supply of, John Hunter on, 425
  views on the causes of eruption of, 826
Teeth and jaws, proper development of, dependent upon normal conditions of nose and naso-pharynx, 850
Tempering fine steel instruments, 117
Temporary crown, to make, in ten minutes, 251
Temporary dentures, 615
Temporary operations or gold fillings in children's teeth, 700
Temporo-maxillary articulation and portion of the mandible, restoration with artificial substitute, 416
Tennessee Board of Dental Examiners, 633
Tennessee Dental Association, announcement, 517
Tests with cement and with saliva, J. P. Buckley on, 192
Texas State Dental Association, announcement, 371, 903
Therapeutic agents, three, 359
Therapeutic use of the X ray, 274
Thermal changes, cement lining to overcome, 430
Thorpe, Burton Lee, "A Brief Review of the Prominent Pioneer Manipulators of Gold Foil," 389
Thumb-sucking, bad effects of, 1254
Thrush, 332
  or sprue, 616
  treatment of, 787
  treatment of, with weak mercurial solutions, 113
Thymophen, 793, 1277
Tic douloureux, salicylic ionization in an obstinate case of, 363
Tin and gold, cavity preparation for, 60
  electro-chemical action in, 446
  method of filling teeth with, 447
Tin, manipulation of, with ivory points or pluggers, 447
  not injurious to the pulp, 447
  the "cry," of, 616
  therapeutic value of, as a filling material, 449

Tin, to remove from plates, 885
Tin fillings, recalcification of dentin under, 447
Tissues of the nose, bad effect of wholesale removal, 1212
Tomlinson, E. S., "Cleft Palate: Its Origin, Effect, and Treatment," 658
Tompkins, H. H., "Oil Colors as an Aid in Porcelain Work," 941
Tongue, a factor to some extent in the molding of the jaws, 1079
  condition of, an aid in diagnosis of digestive disorders, 652
  black, a contribution to the study of, 1163
  congenital deformity of, 652
  its position in the mouth, 1080
  to obtain an idea of its size, shape, and position, 1079
Tooth, misplaced, replanting of, 1062
  pink staining of, explanation of, 948
Tooth and nail corrugations, 251
Tooth-bleaching, an operation too seldom performed, 949
  a case in practice, 950
Tooth-brushes, difficulty of keeping clean, 915
  experiment to ascertain nature of infection of, 915
  mouth-washes not sufficiently germicidal to satisfactorily sterilize, 915
Tooth-brush sterilization, D. M. Hitch on, 912
Tooth-caries, dependent largely on the character of the vital forces, 1102
  some cases in practice, 1103
Tooth-deterioration not common among the ancients, 1100
Tooth-discoloration, 1136
  base-metal pins in crowns as a cause of, 953
  chemical principles involved in, 947
  may result from steel instruments used in mixing cements, 953
  "saprogenous" variety of, 952
Tooth-extraction under cocain and adrenalin anesthesia, death following, 1061
Tooth-grinding, effects of, 1204
Tooth-irregularity, changes in the shape of the arch induced by, 1212
  in children, but slight pressure necessary to correct, 1212
  tendency to, in neurotic individuals, 1210
Toothpick evil, the, 506
Tooth-powder, formula for, 1165
Tooth-powder ingredients, and how to test the purity of precipitated chalk, 618
Tooth-regulation, a case of, 1086
  "crib" method of, 1129
  effects of continuous pressure in, 1085
  extraction in, 1235
  fixed and removable appliances in, 1235
  forces employed in, 1234
  materials used in, 1086
  "positive" system of, 1085
  spring generated with slight variations in form, most effective for, 1086
  use of the chin-cap in, 1086
Tooth-replantation, 502
Tooth-retention in orthodontia, 375
Tooth tissue, quality of, and caries, connection between, 1101
  of children and adults, similarity of, 700
Topical remedies, application of, 1271
Tousey, Sinclair, "Recent Work with the X Ray and High-Frequency Currents in the Diagnosis of Dental Cases and in the Treatment of Pyorrhea and Cancer," 637
Townsend, Elisha, biographical notes on, 392
Transplantation of bone for the relief of saddle nose, with report of one case, 116
Treatment of disease, 1200
Treatment of extreme over-bite, 318
  of fractured jaws, clinic by J. E. Power, 860
  of gangrene of the mouth (noma), 964
  of leucoplakia, 965
  of necrosis of the jaws, 246
  of open-bite malocclusion, 318
  of pericementitis, 963
  of pyorrhea, clinic by A. J. McDonagh, 197
  of root-canals, A. W. Harlan on, 575
  of surgical infections, 117
  preceding extraction of abscessed teeth, 142
Trichloracetic acid and monochloracetic acid in the treatment of root-canals, 465
Trifacial neuralgia, avulsion of the terminal branches of the trigeminal nerve for the cure of, 360
  osmic acid for treatment of, 1058
Trigeminal neuralgia, differential diagnosis of, 791
Trigger, T. C., "Metallic Shell Inlays" (clinic), 668
Triturating force, experiments to determine the amount required in the mastication of different foods, 1190
Trituration, an aid to proper mastication, 1192
  in the mastication of food, the human skull used as a gnathodynamometer to determine the value of, 1189
  mastication made easier by, as found by wearers of artificial dentures, 1192
Trueman, Wm. H., "Dental Education from a New Standpoint," 739
Tubercular infections, rôle of inflammatory conditions of the buccal, nasal, and pharyngeal mucous membranes in, 112
Tubercular ulceration of the mouth, 59
Tucker, Joshua, biographical notes on, 393
Tumors in the mouth, discovery of, by the dentist, 653
  of the floor of the mouth not always ranulæ, 906
Two cases of salivary lithiasis, 245
Two-piece gold crown, simple, method of making, clinic by N. E. Preston, 185

ULCER of the mouth, how to examine, 57
  a simple, 59
Ulceration of the roof of the mouth, 653
Ulcerative stomatitis, 331
Undercuts in porcelain inlay work, 1049
Union Meeting of South German and Swiss Dentists (correspondence), 750
Unity of teaching definite methods in dentistry a crying need, 1180
Universal antidote, a, 507
Universal system of bridge work, clinic by F. L. Fossume, 198
University College of Medicine, Department of Dentistry, commencement of, 798
University of Buffalo, Dental Department, commencement of, 897
University of California, College of Dentistry, commencement of, 800
University of Leeds (Eng.), on dental degrees, 1282
University of Maryland, Dental Department, Alumni Association, 629
University of Maryland, Department of Dental Surgery, commencement of, 706
University of Michigan, College of Dental Surgery, commencement of, 895
University of Minnesota, College of Dentistry, commencement of, 894
University of Pennsylvania, Department of Dentistry, commencement of, 797

University of Southern California, College of Dentistry, commencement of, 800
University of Tennessee, Department of Dentistry, commencement of, 800
Upper denture, method of resetting it when the bite is satisfactory, 118
Uric acid, not a blood constituent, 1097
  over-production of, principles on which it depends, 1097
  production of, in the human system, 1099
Use of non-cohesive gold foil, clinic by C. H. Gerrish, 557
Use of the rubber dam, in setting bandless crowns on anterior teeth, clinic by J. S. Danforth, 561

VACUUM chambers, 969
Van Horn, C. S., "Porcelain Inlays, with Special Reference to Cavity Formation," 821
Vegetables, table giving amount of triturating force necessary for mastication of, 1191
Varicella, early mouth-manifestations of, 330
Varney, Royal W., biographical notes on, 395
Vermont Board of Dental Examiners, 636
Vermont State Dental Society, announcement, 370, 811
Vertical clasps for the retention of partial dentures, 357
Virginia Board of Dental Examiners, 719
Voluminous cancroid of the cheek, 612
Vulcanite, advent of, 863
  to avoid porosity in, 1170

WARREN, GEO. W., "A Manual of Mechanical Dentistry and Metallurgy," review of, 879
Watch crystals as medicine containers, 360
Water as a local anesthetic, 887
Waters, T. S., "Orthodontia as Applied to the Extraction of an Impacted Third Molar," 1092
Waxing together the fragments of a broken plate, 363
Waxing-up of plates, contrivance to facilitate, 361
Webb, Marshall H., biographical notes on, 396
Weber, Henry L., "An Antiseptic Washstand," 34
Wedging the teeth with rubber, inflammation produced by, 1085
Western Dental College, commencement of, 707
Western Reserve University Dental School, commencement of, 896
Weston, Henry, obituary of, 970
West Virginia Board of Dental Examiners, 718
Wetherbee, I. J., "Gold and Tin," 60
Wheeler, Herbert L., "Is There an Ideal Occlusion of the Teeth in the Human Jaws," 24
  "Some Observations upon the Obscure Etiology of Pyorrhea Alveolaris," 473
White decay, 149
White teeth of negroes, reason for the, 1268
Whiting, Frederick, "The Modern Mastoid Operation," review of, 695
Who is My Brother? (editorial), 608
Wire, to bend, 504
Wiring in the treatment of maxillary fractures, when indicated, 30
Wirt, Landis H., "Process of Constructing a Metal Denture with Soldered Tooth-Attachments without Subjecting the Teeth to the Flame," 550
Wisconsin Board of Dental Examiners, 124, 717
Wisconsin State Dental Society, announcement, 716
Woman's Dental Association, announcement, 633
Wood pivots, 285
Wood on the tonsillar tissues of the throat, 1205
Woodward matrix, clinic by J. J. Nelson, 859
Wooffendales, early dentists, biographical notes on, 983
"Worm theory" of decay, Thomas Berdmore on, 424
Writers of the eighteenth century, 422

X RAY, apparatus and technique for, 261
  as an accurate means of diagnosis, 1237
  diagnostic value of, in pathological mouth-conditions, 262
  discovery of, 260
  in dentistry, clinic by Sinclair Tousey, 199
  therapeutic effects of, 1238
  F. LeRoy Satterlee on, 260
  M. I. Schamberg on, 591
X ray and high-frequency currents, in the diagnosis of dental cases and in the treatment of pyorrhea and cancer, 637
  examination with, 639
  measuring the intensity of, 642
  origin of, 637
  precautions in working with, 643
  value of, in diagnosis, 638
X-ray burns, no necessity for, 1237
X-ray demonstration, by M. I. Schamberg, 1237
X-ray treatment in pyorrhea as an adjunct to regular dental treatment, 644
X-ray work, use of fluoroscope in, to be avoided when possible, 640

ZIEM'S experiments in producing nasal stenosis in young animals, 1005
Zinc, renewing, 791
Zinc oxyphosphate a preserver of pulp-vitality, 115
Zinc oxyphosphate cement as a filling material, 603

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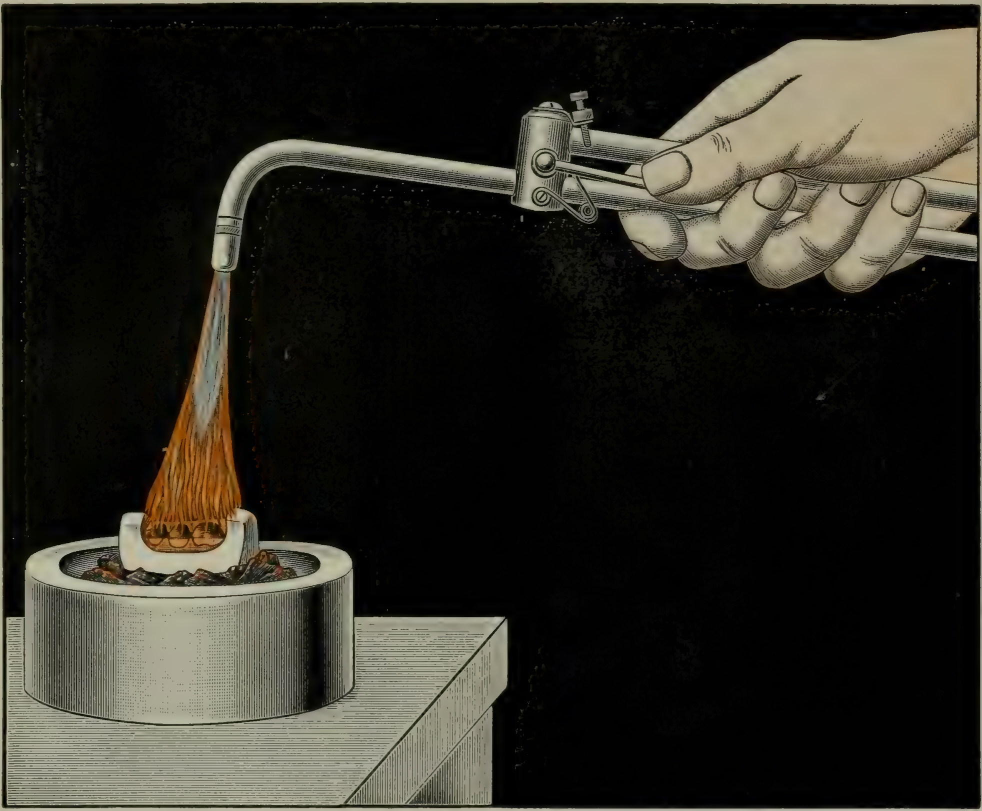

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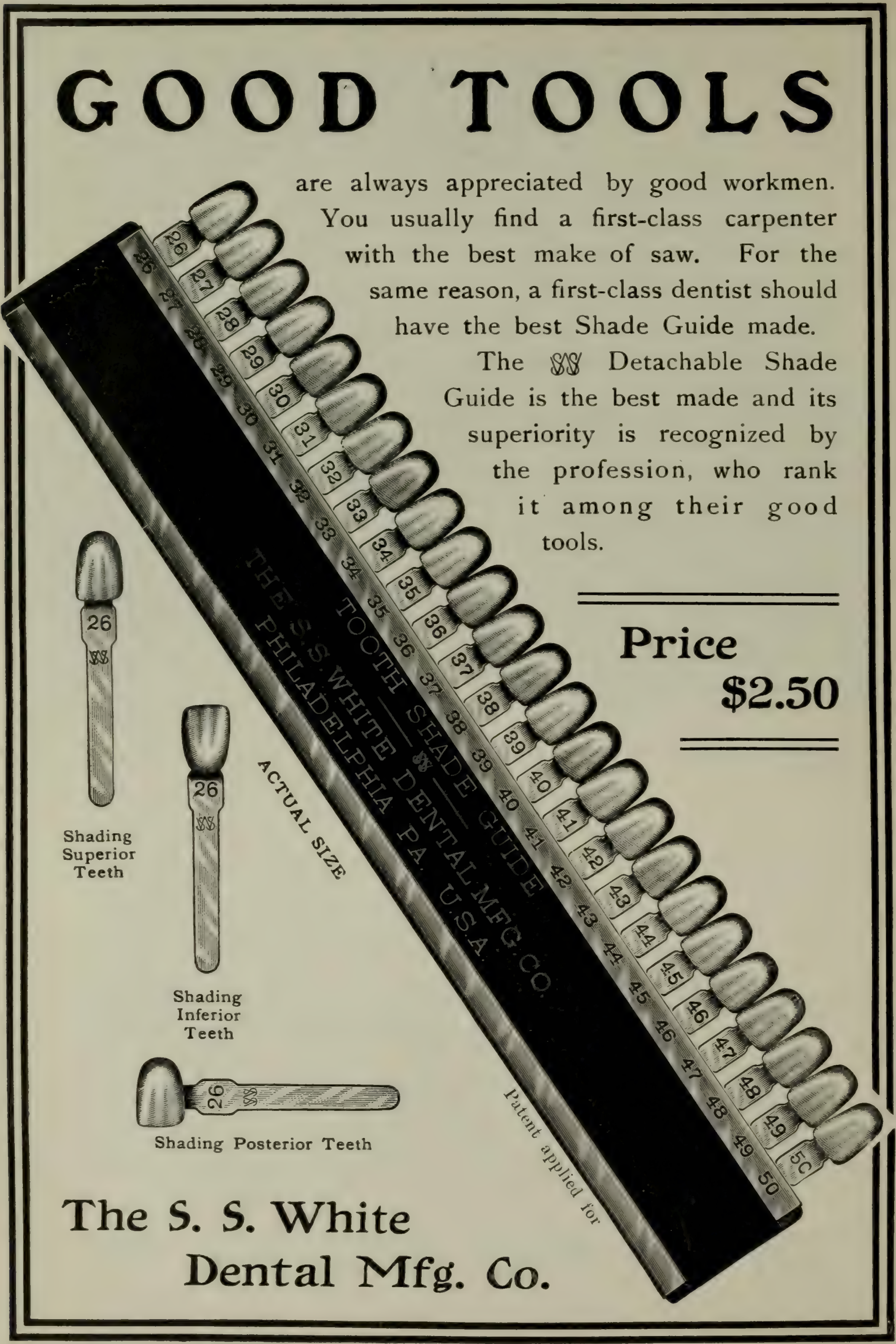
Your aim is to please your patients. The use of "Combination Set" will enable you to do this.

The S. S. White Dental Mfg. Co.



GOOD TOOLS

are always appreciated by good workmen. You usually find a first-class carpenter with the best make of saw. For the same reason, a first-class dentist should have the best Shade Guide made.

The SSW Detachable Shade Guide is the best made and its superiority is recognized by the profession, who rank it among their good tools.

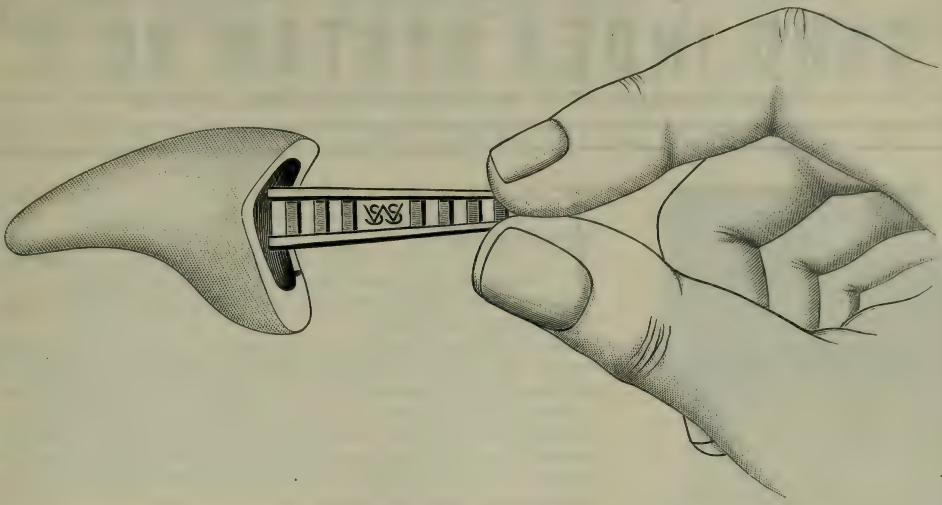
Price
$2.50

Shading Superior Teeth

Shading Inferior Teeth

Shading Posterior Teeth

The S. S. White
Dental Mfg. Co.



HOLDING OUT

against all competition is the history of the Logan Crown after a score of years.

Each year increases its popularity, and there are today many more of these crowns in the mouth than of any other make.

We frequently run across Logan Crowns that have been in use fifteen to twenty years still doing good service.

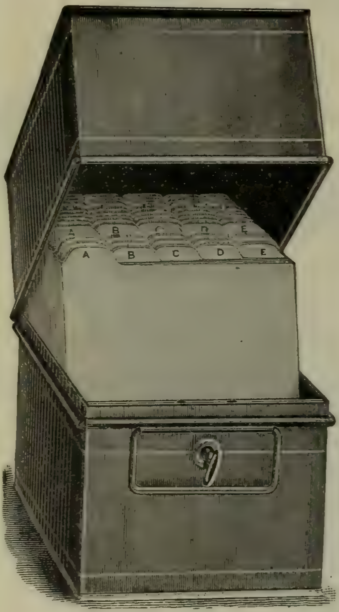
The Logan Crown was designed for service and you make no mistake in using it.

The S. S. White Dental Mfg. Co.

Keeping the Dentist's Accounts

CARD INDEX SYSTEM NO. 1

After Samples of S. H. GUILFORD, A.M., D.D.S.



Actual Size of Tin Case Outfit, 5 in. wide, 8½ in. long, 7½ in. high.

THIS method of keeping the accounts of the dentist with his patients is readily comprehended and easily kept.

It saves the labor of opening a new set of books every year or two, is practically continuous.

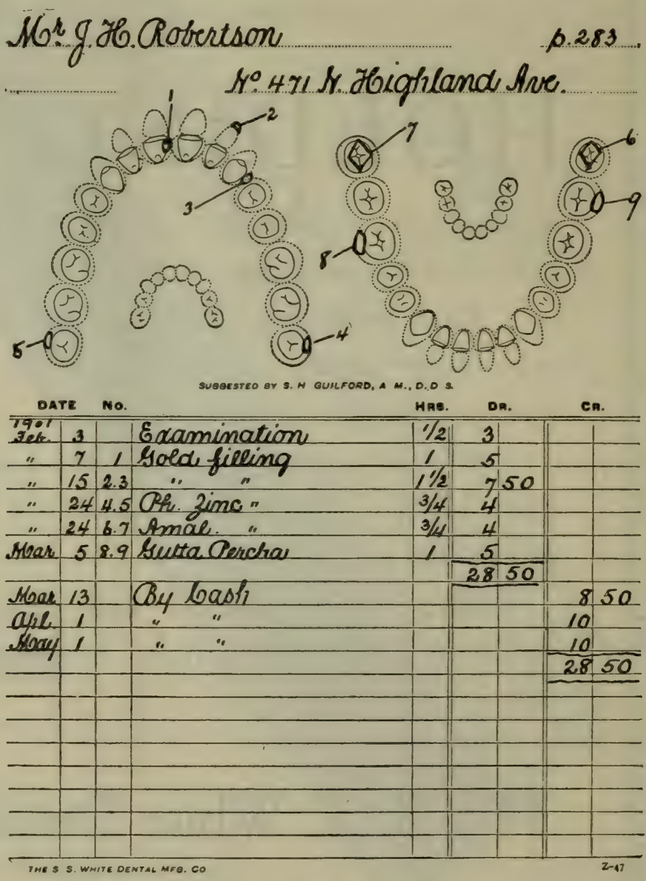
There is never any trouble about finding space to open new accounts.

Each account has a card to itself, which can be taken out at any time or restored after being taken out, without disturbing the "balancing of the books" in either instance.

Only live accounts are in evidence, and it takes but a moment to find the state of any one of them. Dead accounts, as of patients who have died or removed, are destroyed or thrown away. As a matter of fact, the system saves a good deal of labor.

The Advantages of the Loose-Leaf Ledger with Less Labor

RECORD CARD



Mr J. H. Robertson p. 283

No 471 N. Highland Ave.

SUGGESTED BY S. H GUILFORD, A M., D. D S.

DATE		NO.		HRS.	DR.		CR.	
1901 Feb.	3		Examination	½	3			
"	7	1	Gold filling	1	5			
"	15	2.3	" "	1½	7	50		
"	24	4.5	Ph. Zinc "	¾	4			
"	24	6.7	Amal. "	¾	4			
Mar	5	8.9	Gutta Percha	1	5			
					28	50		
Mar	13		By Cash				8	50
Apl	1		" "				10	
May	1		" "				10	
							28	50

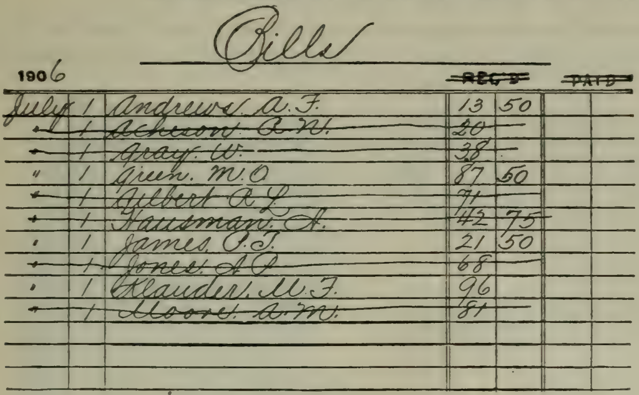
THE S. S. WHITE DENTAL MFG. CO Z-47

Reduced Illustration of Record Card Showing Transactions

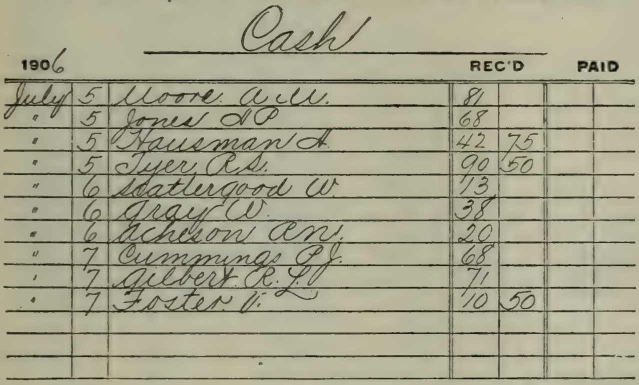
For prices, see page 8

CARD INDEX SYSTEM NO. 1—(Continued)

CASH OR BILL CARDS



1906		Bills	~~REC'D~~		~~PAID~~	
July	1	Andrews A. F.	13	50		
~~"~~	~~1~~	~~Acheson A. N.~~	~~20~~			
~~"~~	~~1~~	~~Gray W.~~	~~38~~			
"	1	Green M. O.	87	50		
~~"~~	~~1~~	~~Gilbert R. L.~~	~~71~~			
~~"~~	~~1~~	~~Hausman A.~~	~~42~~	~~75~~		
"	1	James O. T.	21	50		
~~"~~	~~1~~	~~Jones A. P.~~	~~68~~			
"	1	Klauder M. F.	96			
~~"~~	~~1~~	~~Moore A. M.~~	~~81~~			

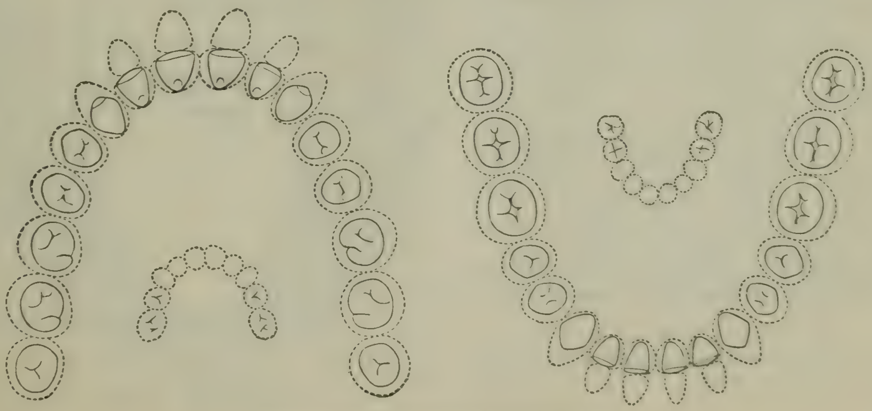


1906		Cash	REC'D		PAID	
July	5	Moore A. M.	81			
"	5	Jones A. P.	68			
"	5	Hausman A.	42	75		
"	5	Tyer R. S.	90	50		
"	6	Scattergood W.	13			
"	6	Gray W.	38			
"	6	Acheson A. N.	20			
"	7	Cummings P. J.	68			
"	7	Gilbert R. L.	71			
"	7	Foster V.	10	50		

The cards are known respectively as "record cards" and "cash or bill cards." The "record cards" (white) correspond to what in an ordinary set of books would be a ledger account. The use of the "Cash or Bill Cards" (which are blue in color) is indicated by their name,—one form answering for both purposes.

The guides tell at a glance the condition of any live account. They are of three colors,—buff, salmon, and blue,—a full alphabetical index of each, which are used in this way: The buff for accounts of patients for whom work is in progress, the salmon for those whose work has been completed but not paid for, and the blue for those which have been settled.

EXAMINATION BLANK NO. 4



Suggested by S. H. Guilford, A. M., D. D. S.

The S. S. White Dental Mfg. Co.

CARD INDEX SYSTEM No. 1—(Concluded)

The System is Used as Follows:

THE Examination Blank is the basis of the work to be done from which the charges are to be made.

When the first work is done—if charge is made for the examination, *that* is the "first work done"—a "Record Card" is inscribed with the name of the patient and the proper charge entered upon it.

The card is then placed in its proper alphabetical position among the Buff Guides. After each appointment, the charges are entered upon the "Record." When all the work indicated by the Examination is completed, the Record is placed among the Salmon Guides. The dentist thus knows that only those accounts found in the Salmon Guides are to be billed or collected. As the bills are sent out the amount of each is entered on a "Bill Card." As cash is received, it is entered on a "Cash Card," the entry on the "Bill Card" erased, and the "Record" placed among the Blue Guides, to remain there until the patient comes again for another examination.

Each "Record Card" represents a separate account. On a "Cash or Bill Card" each line represents an account.

We give examples showing the use of each of the cards; also, the style of the Examination Blank, which is known as our No. 4.

A complete outfit consists of 100 Examination Blanks No. 4, 300 White Record Cards, 15 Cash or Bill Cards, with the three sets of Guides. Cards and Guides are of Bristol Board, 5 x 7 inches. The whole is sold in a japanned tin case with lock and key.

PRICES

Outfit Complete	$5.00
Extra Cards, Guides and Examination Blanks can be bought at any time.	
Record Cards...........per hundred	.75
Cash or Bill Cards, package of 25....	.25
Guides, either color..........per set	.50
" three sets (one of each color)	1.50
Examination Blank No. 4, per pad of one hundred	.20

ALLPORT'S
IMPROVED
Registering Dental Ledger

THAT the Allport Ledger, after forty odd years, is still probably more extensively used than any other dentists' account book is very good evidence of the vitality of the idea underlying it,—a diagram to indicate the location of the operation, a symbol to describe its character. The diagram and symbols cover the needs of any form of practice, and afford a simple, easily kept, accurate record.

Two accounts to the page, each with diagram as shown, with place for name, reference, date of operation, charges, and credit for amounts paid. Size of page 9½ x 11¾ inches.

Good paper, substantially bound, with ample index. In stock regularly as priced below.

The diagram is printed in red, so that the symbols made in black ink are readily seen.

PRICES

340	Pages,	Half Turkey,	Cloth	Sides	$3.50
340	"	" Roan,	"	"	3.00
172	"	" "	"	"	2.00

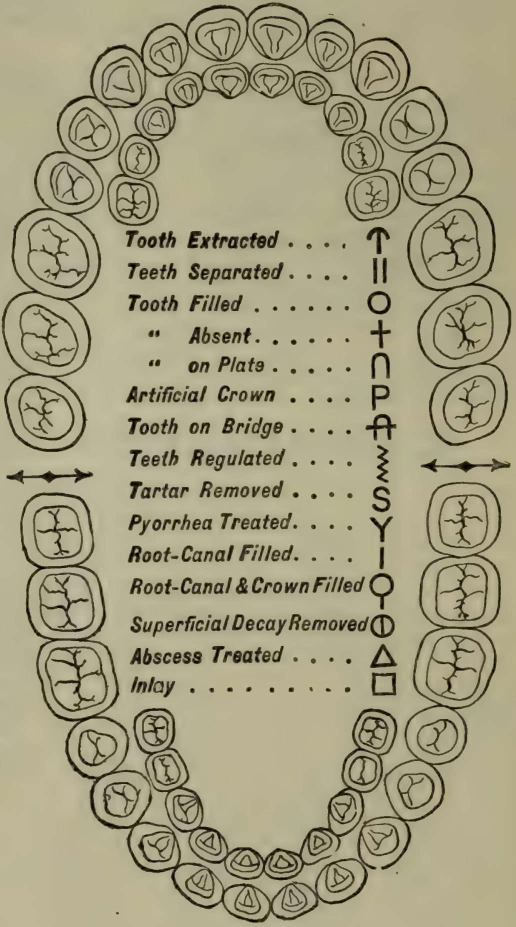
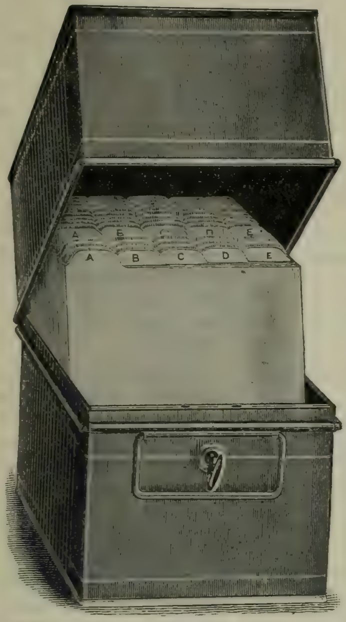

Tooth Extracted . . . . ↑
Teeth Separated . . . . ||
Tooth Filled . . . . . . O
" Absent . . . . . . +
" on Plate . . . . . ∩
Artificial Crown . . . . P
Tooth on Bridge . . . . ⍝
Teeth Regulated . . . . ≷
Tartar Removed . . . . S
Pyorrhea Treated . . . . Y
Root-Canal Filled I
Root-Canal & Crown Filled ⍜
Superficial Decay Removed ⌽
Abscess Treated . . . . △
Inlay . . . . □

Diagram and Symbols

S. S. WHITE CARD INDEX SYSTEM No. 2

A CARD SYSTEM USING THE ALLAN DIAGRAM

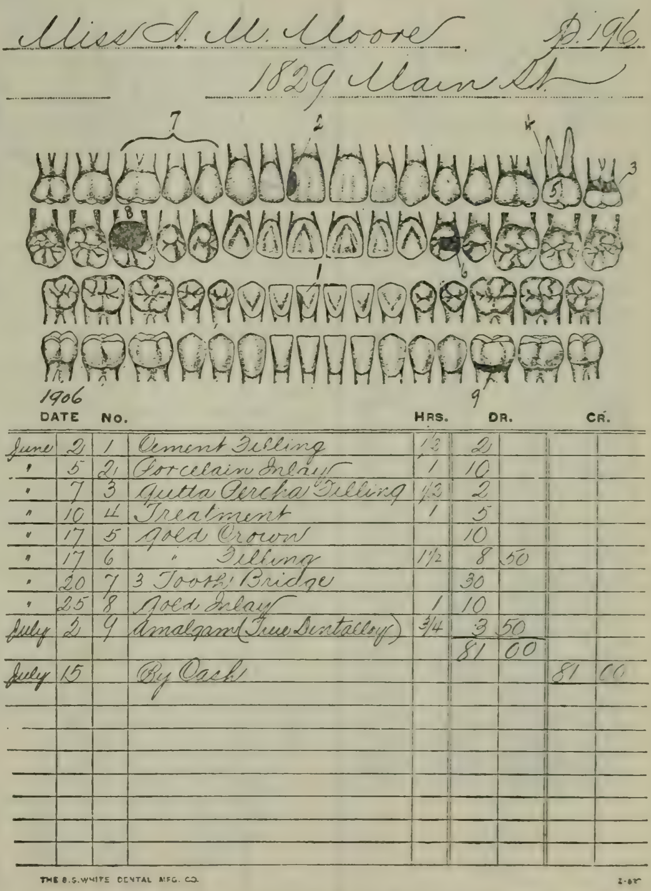


Actual Size of Tin Case Outfit, 5 in. wide, 8½ in. long, 7½ in. high

THE card system of keeping accounts presents so many advantages to the dentist that it is used each year in an increasing number of offices. It saves labor, space, and money, and is so simple that the danger of mistakes is much lessened.

The Allan Diagram—generally pronounced the most complete of all illustrations of the individual Teeth in diagram form—is the feature of the S. S. White Card System No. 2, being printed in red at the top of each "Record Card," and also on the Examination Blank No. 3, a pad of which accompanies the outfit.

A complete outfit consists of 50 Examination Blanks No. 3, 300 White Record Cards, 15 Cash or Bill Cards, with the three sets of Guides. Cards and Guides are of Bristol board, 5 x 7 inches. The whole is sold in a japanned tin case with lock and key as illustrated above.



Miss A. M. Moore P. 196

1829 Main St.

1906

DATE		NO.		HRS.	DR.		CR.	
June	2	1	Cement Filling	½	2			
"	5	2	Porcelain Inlay	1	10			
"	7	3	Gutta Percha Filling	½	2			
"	10	4	Treatment	1	5			
"	17	5	Gold Crown		10			
"	17	6	" Filling	1½	8	50		
"	20	7	3 Tooth Bridge		30			
"	25	8	Gold Inlay	1	10			
July	2	9	Amalgam (True Dentalloy)	¾	3	50		
					81	00		
July	15		By Cash				81	00

THE S.S.WHITE DENTAL MFG. CO.

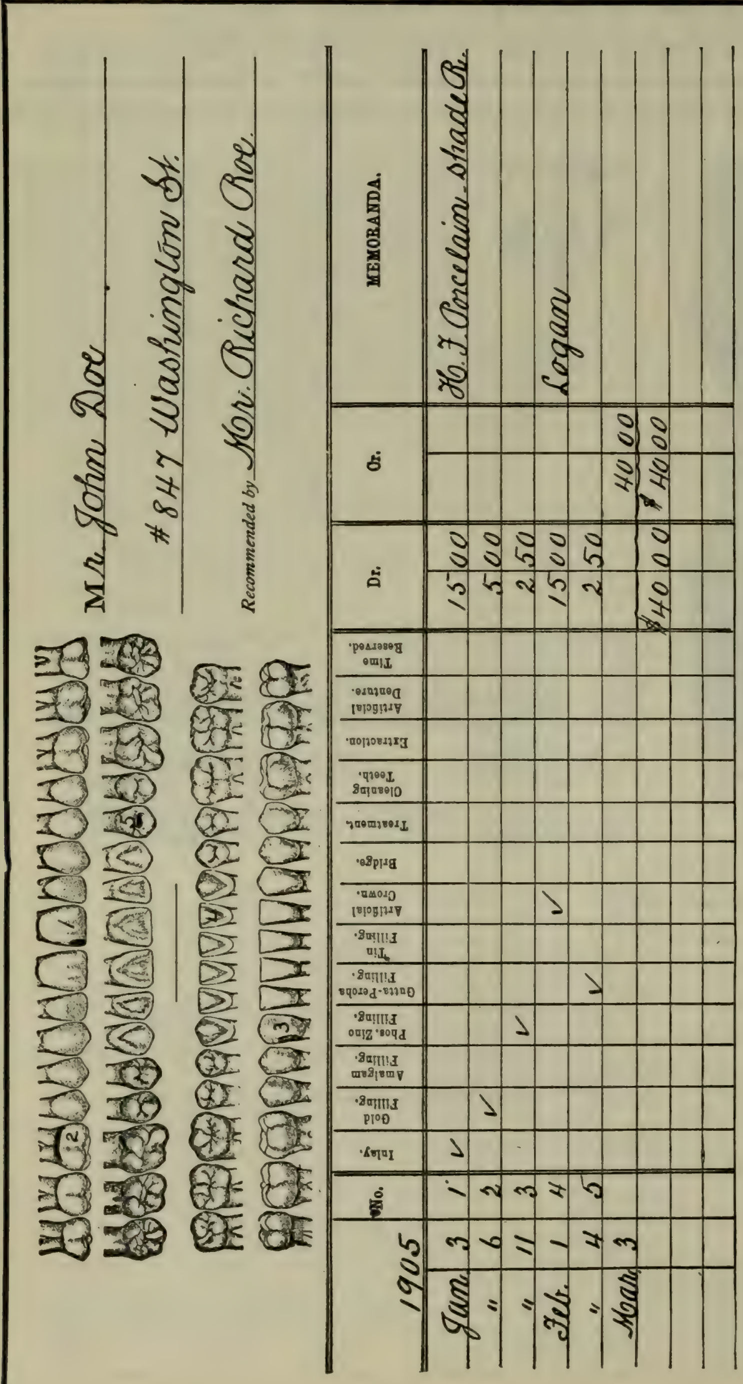
Reduced Illustration of Record Card Showing Transactions

PRICES

Outfit complete	$5.00
Extra Cards, Guides, and Examination Blanks can be bought at any time.	
Record Cards, per hundred	$0.75
Cash or Bill Cards, package of 25	.25
Guides, either color, per set	.50
" three sets (one of of each color)	1.50
Examination Blanks No. 3, per pad of fifty	.20

Send for descriptive circular

The Warren Improved Dental Ledger No. 2



Mr. John Doe

#847 Washington St.

Recommended by Hon. Richard Roe.

1905	No.	Inlay.	Gold Filling.	Amalgam Filling.	Phos. Zinc Filling.	Gutta-Percha Filling.	Tin Filling.	Artificial Crown.	Bridge.	Treatment.	Cleaning Teeth.	Extraction.	Artificial Denture.	Time Reserved.	Dr.	Cr.	MEMORANDA.
Jan. 3	1	✓													15 00		H. F. Porcelain-shade R.
" 6	2		✓												5 00		
" 11	3				✓										2 50		
Feb. 1	4							✓							15 00		Logan
" 4	5					✓									2 50		
Mar. 3																40 00	
															$40 00	$40 00	

Diagram about two-thirds actual size

THIS is an extremely attractive book so far as external appearance goes, an impression which is strengthened by an examination of the plan on which it is laid out, and confirmed positively and finally by actual use.

It is nearly square, 11⅛ x10¾ inches, opens flat, and contains two sizes of accounts, one size occupying an entire page, the other a half-page.

A glance at the reduced reproduction will give an idea of how simple is the method of keeping accounts in this form. You merely fill in the date, put a check in the appropriate column, and enter the amount in the debit column. Each operation is of course numbered upon the diagram, the entries being correspondingly numbered for identification. The diagrams are printed in red, so that the numbers made in black ink are readily seen.

The method is quick, complete, and convenient, as well as simple.

The No. 2 Warren Ledger, 312 pages,—152 with a single account to the page, 160 with two to the page.

Half-bound, American Russia, wine-colored cloth sides, red edges, ample index.

Price . . . $2.50

Dentists' Pocket Diary and Appointment Book

FOR

Registering Appointments for Dental Operations

MONDAY 19

8		1	
9		2	
10		3	
11		4	
12		5	

TUESDAY 19

8		1	
9		2	
10		3	
11		4	
12		5	

WEDNESDAY 19

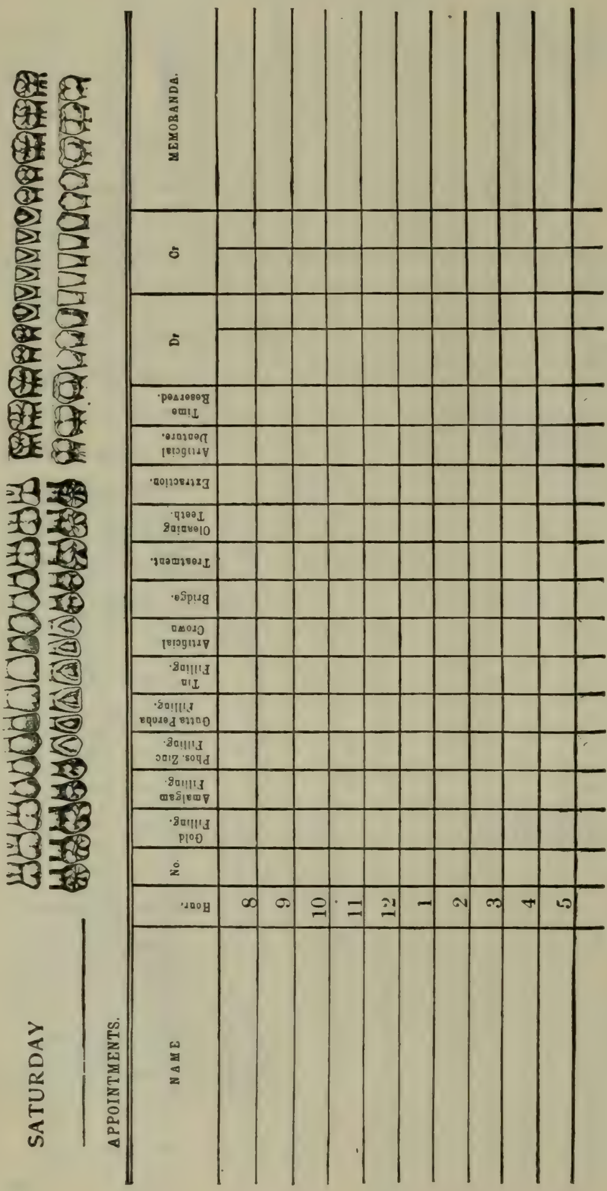
8		1	
9		2	
10		3	
11		4	
12		5	

THE Diagram shows the exact size and style of a page of the Pocket Diary and Appointment Book, presenting, when open, engagements for one week. The figures denote the hour of the engagement. It contains blanks for 54 weeks, and, being without date, is good for any time. It has also a neat Memorandum attached. One of the oldest and most popular forms.

Price, Flexible Cover, Gilt Edge . . $0.55

Price, Flexible Cover, Gilt Edge, with Pocket and Tuck 80

THE S. S. WHITE DENTAL APPOINTMENT BOOK NO. 3


SATURDAY
APPOINTMENTS.
NAME
Hour.
8
9
10
11
12
1
2
3
4
5
No.
Gold Filling.
Amalgam Filling.
Phos. Zinc Filling.
Gutta Percha Filling.
Tin Filling.
Artificial Crown
Bridge.
Treatment.
Cleaning Teeth.
Extraction.
Artificial Denture.
Time Reserved.
Dr
Cr
MEMORANDA.

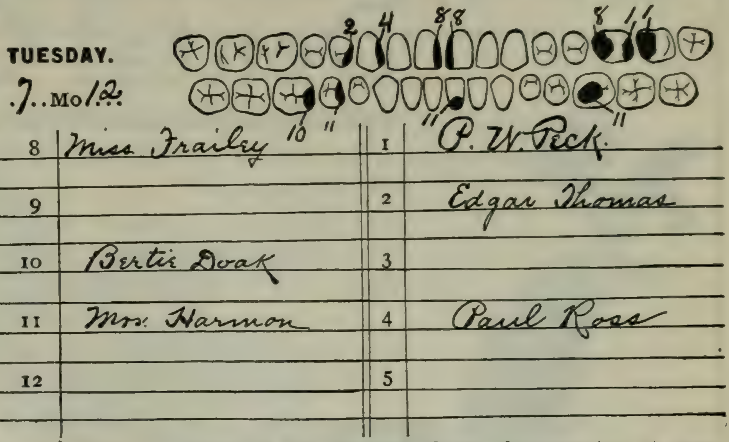
An appointment Book with the unequaled Allan diagram, more especially for those who use the Warren Dental Ledger.

The book is oblong; the pages, of which there are 312, are 5¼ x 9 inches. The diagram is printed in red (natural size), so that marks upon it will be more readily seen. Below the diagram are the spaces for appointments from 8 A.M. to 5 P.M. with headings for all the usual operations, and memorandum space for any special notes. The reduced reproduction of a page herewith gives a clear idea of the advantages of this book.

Printed on good paper, paged and indexed, bound in cloth, with leather back; red edges.

Price . . . $1.25

THE DIAGRAM APPOINTMENT BOOK



TUESDAY.
7 Mo 12

8	Miss Frailey 10 "	1	"P. W. Peck"
9		2	Edgar Thomas
10	Bertie Doak	3	
11	Mrs. Harmon	4	Paul Ross
12		5	

THE feature of this Appointment Book is the facility which it affords for making a brief but clear memorandum of the work to be done for each patient at the time the appointment is made.

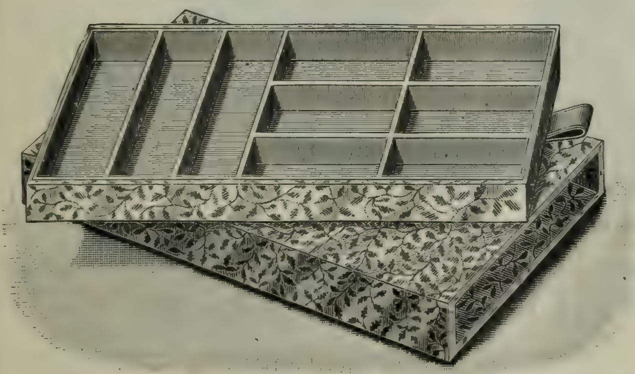
For each day there is a diagram of the teeth. As appointments are made, the hour set apart is noted upon the diagram, opposite the tooth or teeth to be treated. When the patient takes his place in the chair, a glance at the diagram shows the operator at once where the work is to begin.

The illustration shows a typical day's markings.

The book is 6¾ x 4¼ inches. In the front are calendars for three years, and a table showing the number of days from any day in one month to the same day in any other month; following this are the appointment pages, a full week's appointments being shown when the book is opened. Back of this are pages for memoranda and blanks for monthly cash account and yearly summary. Supplied in cloth or leather.

Price, Cloth	$0.40
" Leather	.60

GOLD TRAY



THIS neat, compact sliding Tray affords a convenience for keeping different forms of gold filling-materials handy for selection. It has compartments for an assortment of mats, pellets, cylinders, ropes, or strips, so that selection can be made without loss of time.

The Tray is nicely gotten up, with a snug-fitting case, covered with a paper which shows varying designs in different lights. The partitions are covered with gilt paper, and the bottoms lined with soft chamois. Slid into the case, the Tray is protected from dust or the loss of its contents, and occupies only a little space (about 4⅝ x 3¼ x ½ inch) in the Bracket-Table Drawer.

Price $0.25

The WILKERSON Dental Chair

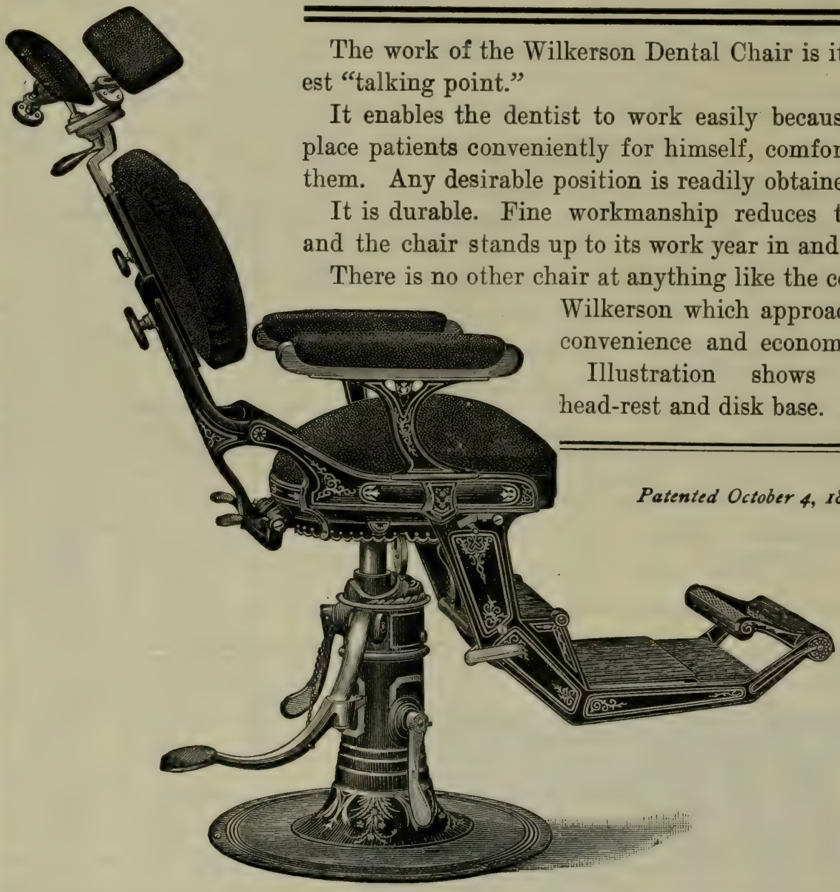
The work of the Wilkerson Dental Chair is its strongest "talking point."

It enables the dentist to work easily because he can place patients conveniently for himself, comfortably for them. Any desirable position is readily obtained.

It is durable. Fine workmanship reduces the wear, and the chair stands up to its work year in and year out.

There is no other chair at anything like the cost of the Wilkerson which approaches it in convenience and economy.

Illustration shows Watkins head-rest and disk base.



Patented October 4, 1892

PRICES WITH DISK OR LEG BASE

Foot-boards covered with Wilton Carpet or Rubber

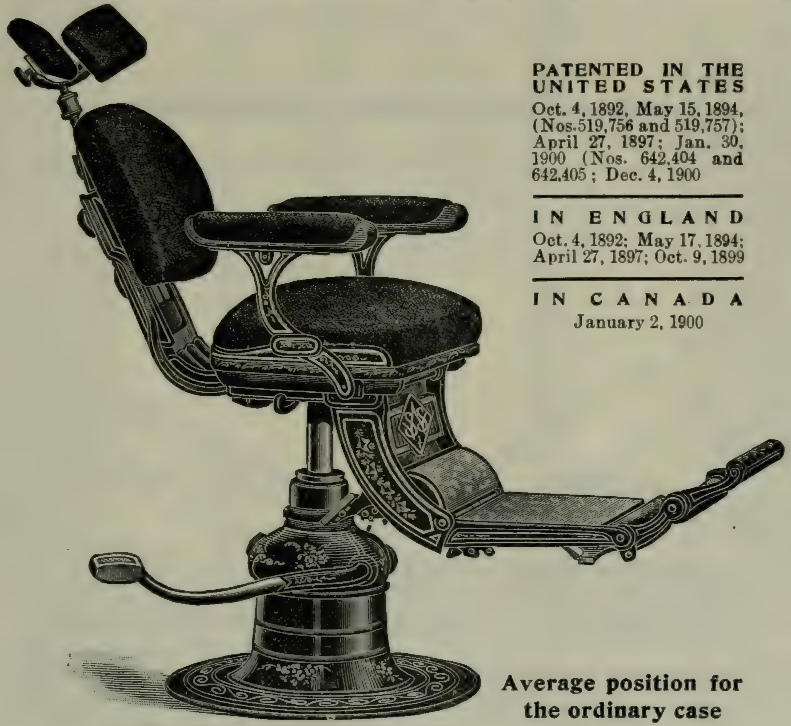
In Green or Maroon Plush, with Watkins Sectional Head-rest	$135.00
In Green or Maroon Plush, with Wilkerson Head-rest	125.00
In Finest Green or Maroon Plush, puffed with Plush, trimmed with Silk Cord, with Watkins Sectional Head-rest	155.00
In Green or Maroon Plush, puffed with Plush, trimmed with Silk Cord, with Wilkerson Head-rest	145.00

THE NEW MODEL
WILKERSON CHAIR

PATENTED IN THE UNITED STATES
Oct. 4, 1892, May 15, 1894, (Nos. 519,756 and 519,757); April 27, 1897; Jan. 30, 1900 (Nos. 642,404 and 642,405; Dec. 4, 1900

IN ENGLAND
Oct. 4, 1892; May 17, 1894; April 27, 1897; Oct. 9, 1899

IN CANADA
January 2, 1900



Average position for the ordinary case

In a Class by Itself—Some Reasons Why

PUMPING a chair up is the easiest and quickest way to raise it. The New Model Wilkerson Chair has an unequaled hydraulic lift,—a solid steel core for pump plunger which fits the brass barrel so snugly you can compress air with it. It won't wear leaky.

Holding a chair in position mechanically is the surest way to secure rigidity. The New Model Wilkerson has a mechanical lock,—thrown in by swinging the pumping pedal a few inches to the left,—which relieves the oil of the weight and fixes the chair against rotation or settling.

Swinging the pumping pedal to the right unlocks the New Model Wilkerson Chair, lets the oil support the weight, opens the valve for its escape, and the chair goes down so smoothly the patient doesn't feel it.

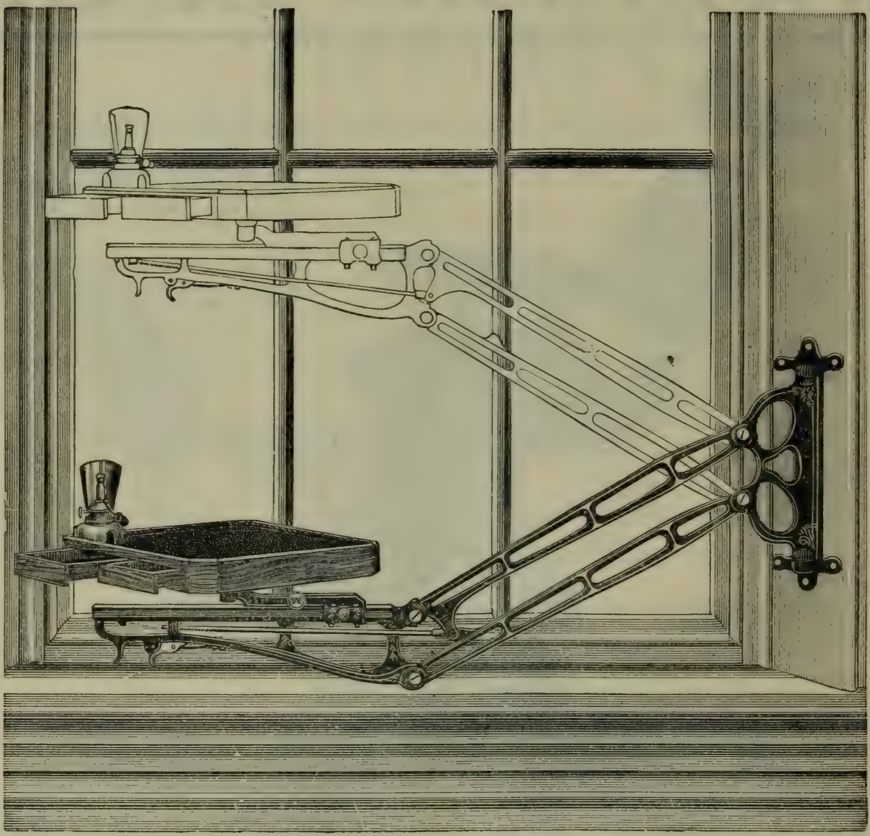
The pumping pedal controls the raising, lowering, and rotating movements, and locks the chair against all three.

Every movement smooth: every position rigid.

PRICES

In Finest Maroon or Green Plush, Footboards covered with Wilton or Cork Carpet	**$200.00**
In Finest Green or Maroon Plush, puffed with Plush, trimmed with Silk Cord, Footboards covered with Wilton or Cork Carpet	**220.00**

THE S. S. WHITE TOOL BRACKET No. 1



IN this Bracket the tray has a horizontal adjustment of 15 inches, which, with the reach of the pivoted arms, permits it to be swung 45 inches from the wall. The illustration shows the highest and lowest positions. It is raised by lifting to the desired height an automatic lock holding it wherever placed. To lower it, grasp the handle near the end of the carrier-frame, and compress the trigger with the finger, when the table sinks to the required level; releasing the trigger locks it. Both movements are simple and require but one hand. The tray shown is the ordinary Imitation Rosewood Table.

PRICES

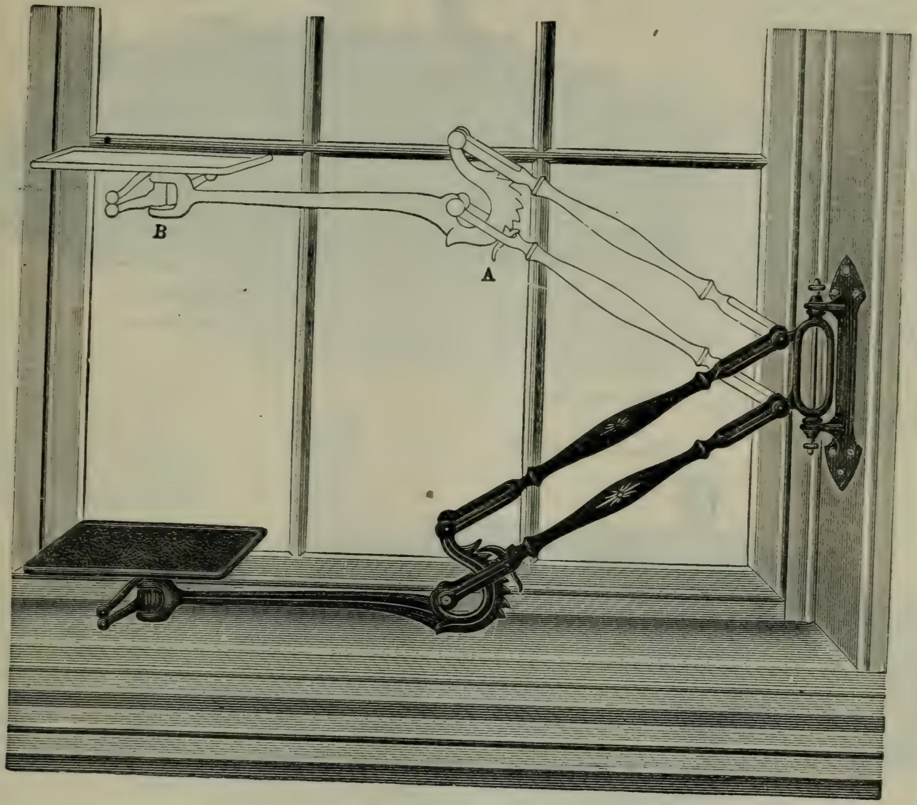
Japanned, without Table	$10.00
With imitation Rosewood Table	16.00
" Plain-side Allan Table, Walnut or Oak	20.00
" " " " Mahogany	22.00
" Glass-side " " Walnut or Oak	22.00
" " " " Mahogany	24.00
" Holmes Table, Walnut or Oak	40.00
" " " Mahogany	43.00

Alcohol Lamp and Shield are included in prices of table combinations.

THE S. S. WHITE TOOL BRACKET No. 2

WITH TABLE

Patented September 18, 1894



THIS Bracket and Table combine simplicity of construction and convenience in the highest degree. The illustration shows the arrangement of the parts so clearly that but little description is needed. When fully extended it reaches 52 inches from the place of attachment. The variation in the height of the Table is 23 inches. By the adaptation of the parallel bars B, the horizontal extension may be shortened 15 inches. For this movement a slight push on the edge of the Table is all that is required.

When the arms B are in position at right angles with the Bracket, the Table may be made immovable by pressing the arms on both sides in the same direction, either forward or backward. To raise the Table, lift the Bracket, and the ratchet and trigger A, acting automatically, will hold it at any desired height. The Bracket is japanned and ornamented in bronze.

The Table made especially for this Bracket is a plain tray, 12 inches square, covered with leatherette, raised rim, no drawers. Won't warp.

We do not hesitate to say that this is in every way the best and most convenient Bracket and Table ever offered at the price.

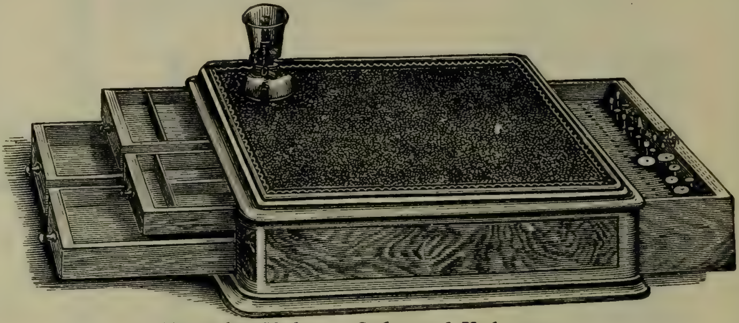
Price, complete as illustrated.......................................$10.00

THE ALLAN BRACKET TABLE

Wood-Paneled

THIS handsome and convenient Table is 13½ inches square by 3½ inches deep, and contains five drawers, one of which is 4 inches long, 12 inches wide, and 2½ inches deep, containing 131 holes for engine-burs, disks, etc.

The other four drawers are each 8 by 5 by 1 inch. The upper ones are lined with cloth and have movable slides to adjust the spaces for the different filling-materials. The lower drawers are without lining or slides. The lamp is clamped firmly to the table by a metal holder, providing against its being upset by ordinary accidents.

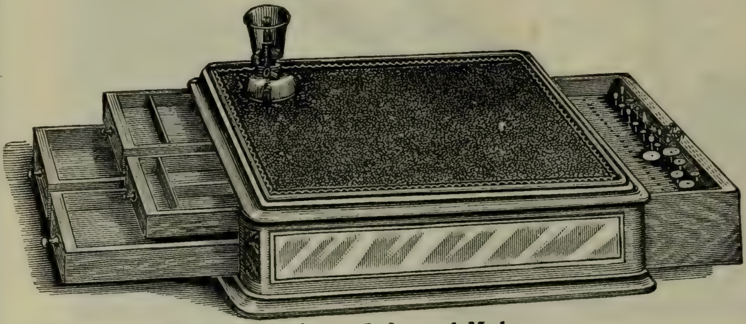


Made in Walnut, Oak, and Mahogany

PRICES

Walnut or Oak, including Lamp and Shield	$10.00
Mahogany " " " "	12.00

Glass-Paneled



Made in Walnut, Oak, and Mahogany

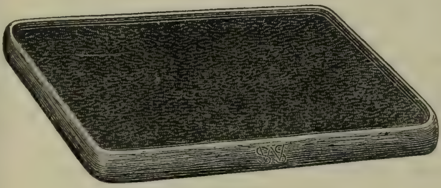
Precisely like the regular Allan, except that the panels are of heavy French plate-glass instead of wood.

Price, Walnut or Oak, including Lamp and Shield $12.00

Price, Mahogany, including Lamp and Shield.... 14.00

In ordering an Allan Table, either Wood or Glass Panel, specify whether wanted in walnut, oak, or mahogany. Unless the order so specifies we send the walnut table.

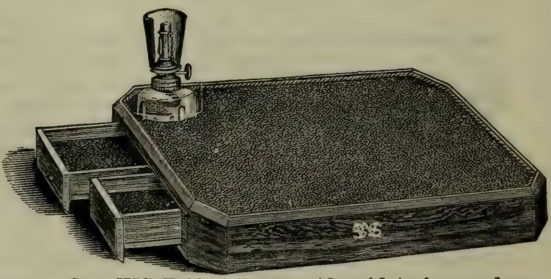
TABLE FOR No. 2 BRACKET



THIS Table is twelve inches square, covered with leatherette. The edges are raised about a quarter of an inch, to prevent instruments from rolling off when it is moved. It is put together in the strongest manner, and it is so firmly braced that it is impossible for it to warp.

Price, with Socket for No. 2 Bracket,...$3.00

IMITATION ROSEWOOD TABLE



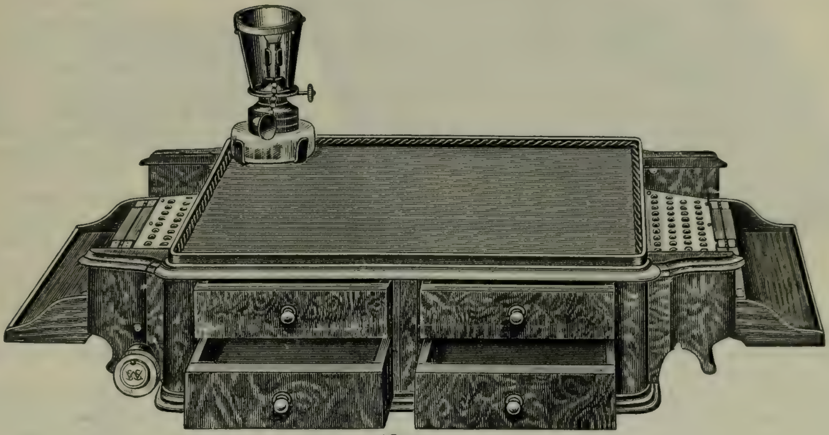
THIS Table measures 12 x 12 inches, and contains two drawers, each 11½ inches long by 4½ inches wide, for holding instruments, foils, etc.

The top is covered with fine cloth and edged with silk cord.

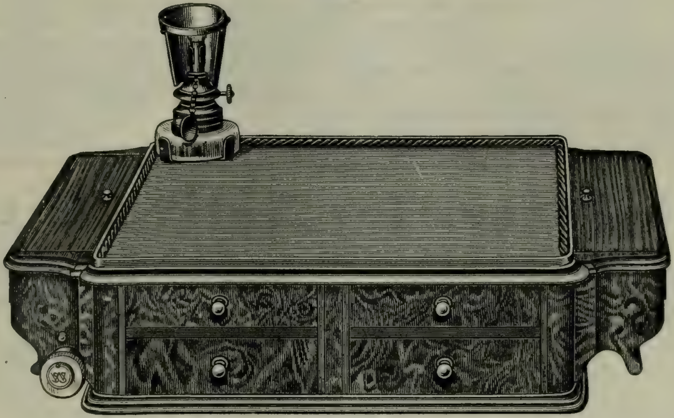
The drawers open only at the lamp side. The lamp has a metal holder which clamps it firmly so that it cannot be thrown from the table by an ordinary accident.

Price, including Lamp and Shield.......$6.00

THE HOLMES BRACKET TABLE



(Open)



(Closed)

THE Holmes Bracket Table is the handsomest ever offered to the profession, as well as one of the most convenient. Fashioned somewhat after the pattern of the Allan Table, it differs widely in its appointments. The outside measurements are—length, 17¾ inches; width to face of knobs, 15⅝ inches; depth 4¼ inches. The four drawers are made the entire length of the Table, and can be opened from either end. The wings on either side contain nickel-plated racks for holding engine-bits. disks, right-angle burs, etc. The holes for the disks are drilled entirely through, so that the disks lie flat upon the surface and can be raised from the underpart. These racks are underlaid with leather, which if slightly oiled will keep the bits clean and bright. Beneath one of the wings is a nickel-plated cotton-holder containing a spring which pushes the cotton forward and keeps it constantly ready for use. It is made in the best manner throughout, and finished beautifully.

Made in Walnut, Oak, or Mahogany. Walnut sent unless Oak or Mahogany is specified

Look for the Trade-Mark.

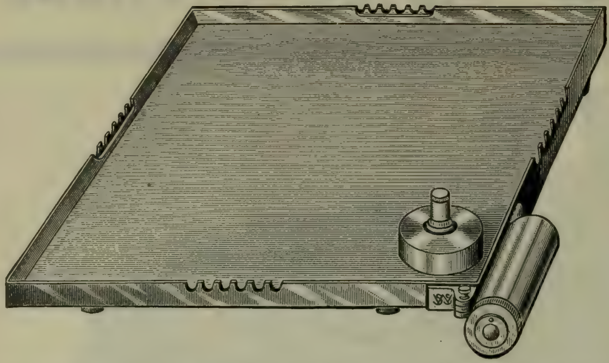
Price, Walnut or Oak, including Lamp and Shield	$30.00
" Mahogany, " " " "	33.00

TABLE PADS

You can preserve the cover of your Table. keep it fresh-looking and free from stains, by using a Table Pad. Made of Paper Fiber Lint, with "pinked" edges. They are neat and useful, and really ornamental.

Price, for Allan Table	each	$0.10
" " " "	per doz.	1.00
" " Holmes Table	each	.12
" " " "	per doz.	1.20

The S. S. White Aseptic Bracket Table



THIS Table is cleanly and handsome, and can be sterilized readily. Another claim for recognition equally important is its helpfulness. It carries the instruments and other operative appliances so that they at least appear to be handier. You have only to think the instrument and it stands out distinctly before you. This is because of the glass surface against which it rests, which brings it out in bold relief. Then, again, intelligent patients are fast acquiring a knowledge of sterilizing, asepticism, etc., and they recognize with pleasure and appreciation any appliance which shows progress in that direction.

A glass plate, sufficiently heavy and tough, is held in a metal frame, which is supported in the usual manner of our Bracket Tables.

The glass is ground on one side, plain polished on the other, perforated in one corner for the reception of a pivot supporting a Capital lamp. Either face may be turned upward, and it is easily removed from the frame for sterilizing. Size in the clear, 12 x 12 inches.

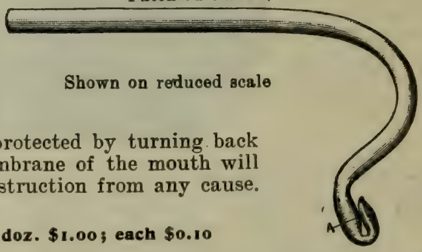
The frame is nickel-plated, with racks formed on each side to support instrument handles and keep them from rolling. At one corner a handy cotton-holder is attached.

This table ought to have a large sale among operators who appreciate neatness and plain, quiet beauty. Its chaste design and handsome finish impart a dignity to its appearance which cannot fail to attract, while its usefulness will make a warm friend of its owner.

Price, including Lamp and Cotton-Holder $15.00

Mouth-Pieces for Saliva Ejectors

IMPROVED GLASS MOUTH-PIECE



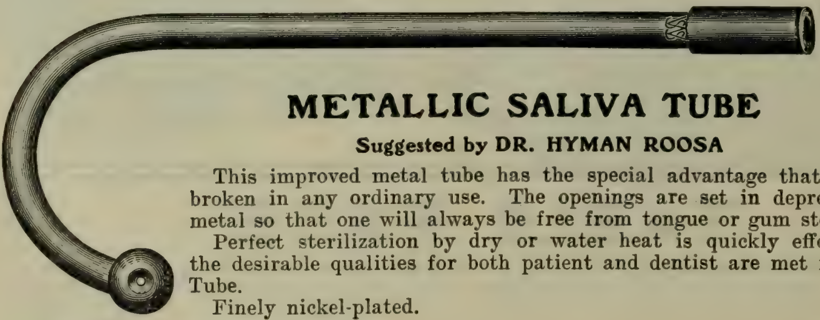
Patented June 4, 1895

Shown on reduced scale

DR. J. SIMONSON'S

In this very practical device, the orifice at A is protected by turning back over it the end of the tube, so that the mucous membrane of the mouth will not be drawn into it, and it will be less liable to obstruction from any cause. Adapted for use with our Improved Saliva Ejector.

Price . . . . per doz. $1.00; each $0.10



METALLIC SALIVA TUBE

Suggested by DR. HYMAN ROOSA

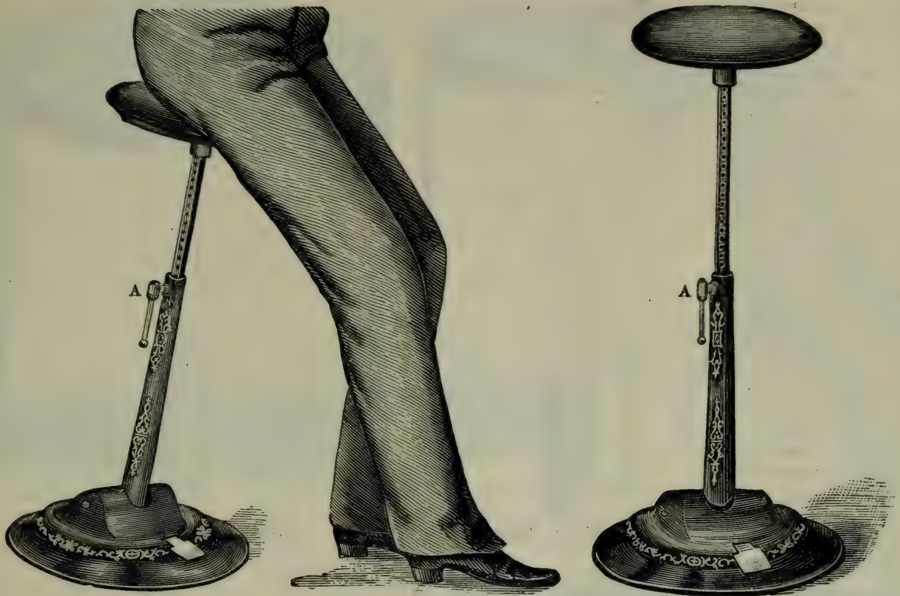
This improved metal tube has the special advantage that it cannot be broken in any ordinary use. The openings are set in depressions of the metal so that one will always be free from tongue or gum stoppage.

Perfect sterilization by dry or water heat is quickly effected, and all the desirable qualities for both patient and dentist are met in this Saliva Tube.

Finely nickel-plated.

Price, Roosa's Improved Saliva Tubes . . . . each $0.75

THE LYON IMPROVED ADJUSTABLE STOOL



THE Lyon Adjustable Stool, used habitually or occasionally, will prevent that feeling of exhaustion that comes from standing too long at the chair. The dentist who has a modern dental chair, the Wilkerson or the New Model Wilkerson for instance, will have, while seated on the Lyon Stool, the elevating, lowering, locking and tilting mechanism of the chair within easy reach of his foot or knee, the back and head-rest movements under his hand, all as easily operable as if he were standing.

The seat of the stool revolves freely upon a rod sliding in a standard. The standard trunnioned within the base is locked by a rachet controlled by a treadle. Pressure of the heel on the treadle enables the operator, while seated, to change the angle of the stool, thus shifting the weight and relieving the muscles of the back. The inclined position also allows the feet to rest upon the floor, dispensing with the use of a footstool.

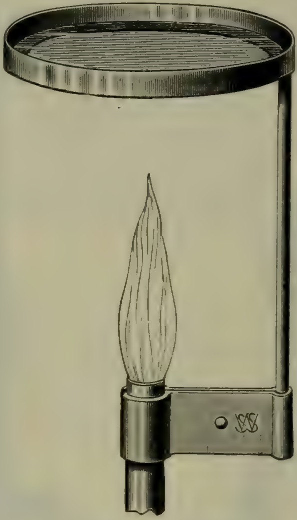
The height can be varied from twenty-three to thirty-five inches from the floor. A series of holes or pockets for the reception of a spring plunger are drilled in the bottom of a groove extending from end to end of the supporting-rod. The plunger, which also swivels, is controlled by the lever A. Pulling the knob of the lever away from the standard lifts the plunger out of its pocket, releasing the supporting-rod, so that the seat can be raised or lowered. Upon the lever being released, the spring throws the plunger forward, seating it in the proper pocket and locking the seat at the proper height.

Base and standard are japanned black, neatly ornamented, plunger-lever and treadle nickel-plated, seat upholstered with curled hair, and covered with finest maroon or green plush.

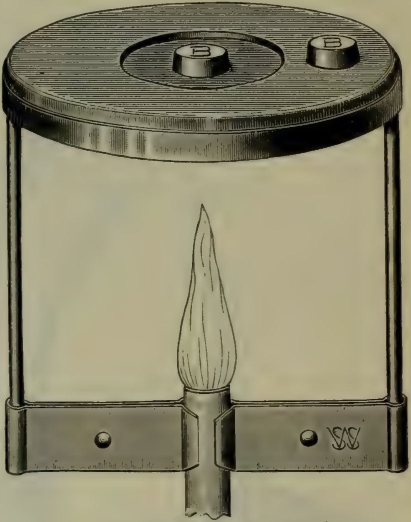
Price **$15.00**

Mica Annealing Trays

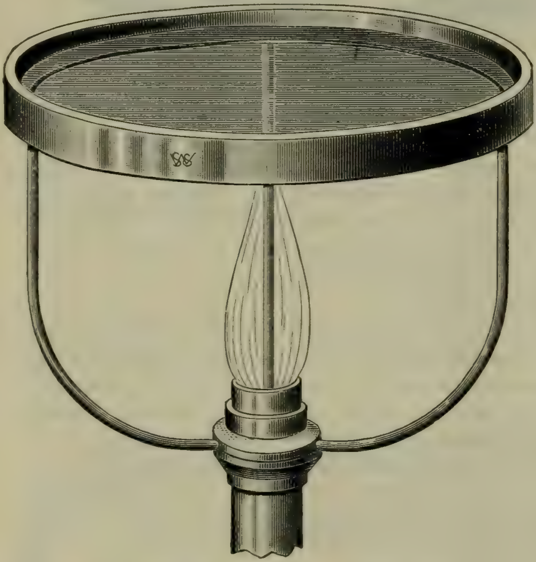
MICA transmits the heat of a flame undiminished, yet absolutely bars the products of combustion. Gold placed upon it—at the proper distance above the flame—is quickly and perfectly annealed without contamination. The line of Annealing Trays herewith shown affords the unequalled advantages of Mica in a number of convenient forms adapted for use with various lamps and burners.



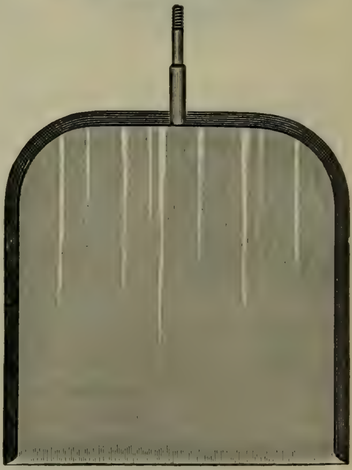
No. 3. 1½ in. diameter



No. 4. 2⅛ in. diameter



No. 5. 2¾ in. diameter



No. 6. About 3 in. square

ANNEALING Trays Nos. 3, 4, and 5 are circular disks of mica with frame and attachments for our lamps and burners. Nos. 3 and 4 are adapted to Gas Burners Nos. 17 and 20, No. 5 to Alcohol Lamps Nos. 1, 2, 21, and 22. No. 6 is a shovel-shaped sheet of mica in a metal frame, to be used with a cone-socket handle. A new sheet of mica can be slipped in when necessary.

Tray No. 4 has, besides the mica annealing disk, a soapstone plate for heating gutta-percha, in which a metal button melting at 212° F. shows the softening temperature of low-heat gutta-percha. A second button, B, melting at 230° F., is substituted when high-heat gutta-percha is used.

Metal parts of all the Trays, brass, nickel-plated.

Price,	No.	3	$0.40
"	"	4, with soapstone and mica disks	.75
"	"	5	.75
"	"	6	.40

Anesthesia by Nitrous Oxid and Oxygen Combined

Patented
March 22, 1898

SIGNAL advantages are gained in the administration of nitrous oxid combined with oxygen over the nitrous oxid alone.

First, with a proper proportion of oxygen, the patient experiences none of the feeling of suffocation common to the ordinary method.

Second, all danger of asphyxia is banished.

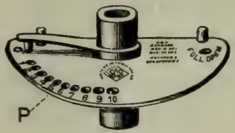
Third, the anesthetic state can be prolonged indefinitely without danger.

Fourth, the return of consciousness is unaccompanied by disagreeable symptoms.

These are the reasons for preferring the non-asphyxial method.

We have two apparatuses for the application of this method,—a two-cylinder and a three-cylinder. The first (as illustrated) provides for one cylinder each of nitrous oxid and oxygen. The second permits the placing of two cylinders of nitrous oxid and one of oxygen. Small or medium cylinders can be used.

In each case there is perfect provision for the control of the two gases, separately and combined. The gases flow from the cylinders into separate bags, whence they pass to the mixing chamber, and thence to the inhaler.

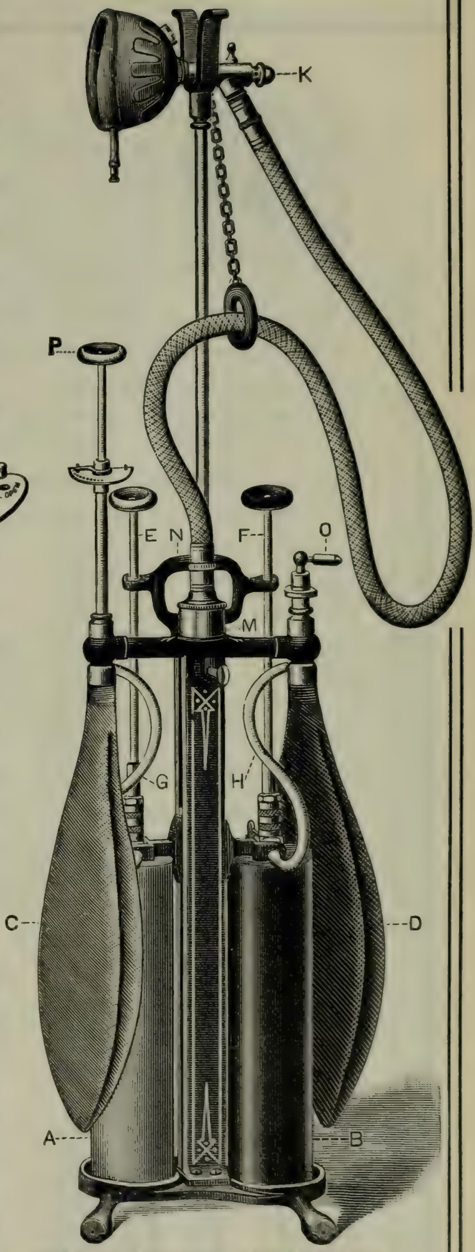


GAGE-PLATE

Oxygen Cylinders are always red; Nitrous Oxid Cylinders are always black. The keys and bags correspond in color, so that there is little chance to place the cylinders in wrong position.

The apparatuses are substantially made and handsomely finished.

Full description in our Catalog of Liquefied Nitrous Oxid.



TWO-CYLINDER APPARATUS

Two-Cylinder Outfit

N_2O and O Apparatus, less Cylinders	$45.00
Complete with two small cylinders containing respectively 100 gals. N_2O and 40 gals. Oxygen, 4 ft. silk-covered tubing, two (2) two-gallon Gas Bags, and No. 3 Inhaler with inflatable face-piece	61.00
Complete, as above, with two Medium Cylinders containing respectively 250 gals. N_2O and 75 gals. O	73.75

Three-Cylinder Outfit

N_2O and O Apparatus, less Cylinders	$50.00
Complete with three small Cylinders, two containing 100 gals. each of N_2O and the third 40 gals. of Oxygen, 4 ft. silk-covered tubing, two (2) two-gallon Gas Bags, and No. 3 Inhaler with inflatable face-piece	74.00
Complete as above with three medium Cylinders, two filled with N_2O (250 gals. each) and the third with Oxygen (75 gals.)	93.75

Either of these outfits will be supplied with or without cylinders as desired

CUTTING INSTRUMENTS

MADE AND CLASSIFIED ACCORDING TO THE

SYSTEM OF DR. G. V. BLACK

DR. G. V. BLACK, as one step in teaching of the preparation of tooth cavities on scientific principles, formulated rules for the construction and use of cutting or excavating instruments of definite dimensions. Founded on these rules he laid out a scheme for a set of the instruments themselves. These instruments—Excavators, Chisels, etc.—in general form are like well-known instruments of the same character, but they are more accurately gaged as to width of edge, length of blade, angle of blade to shank, etc.

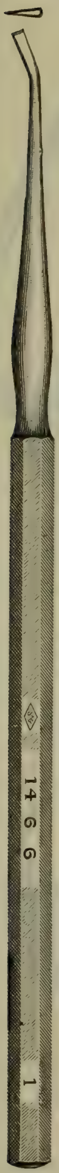
The complete set consists of 102 instruments, with which it is claimed any sort of hand excavating may be accomplished.

Dr. Black's object, it should be borne in mind, was the teaching of exactness in instrumentation. The instruments were classified by forms and measurements so that the teacher should be able to indicate surely and quickly the particular one to be used for a given operation.

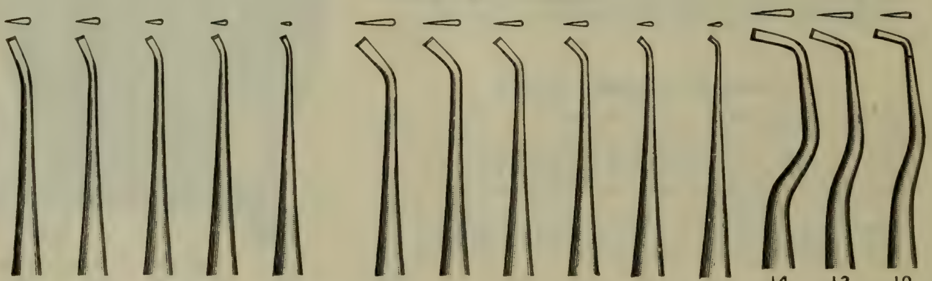
For convenience, the metrical system is used for the measurements, the width of the cutting edge being taken in tenths of a millimeter, the length of the blade (from the center of the angle to the edge) in millimeters, and the angle of the blade in centigrades (one-hundredths of the circle). The instruments are made as near as is commercially practicable to those measurements. The formulæ are always read in the order here indicated, with the name of the instrument, as hatchet, hoe, etc., prefixed. Thus "hatchet 14-6-6" would indicate to one familiar with the system a hatchet excavator with a cutting edge fourteen tenths of a millimeter wide, on a blade six millimeters long, set at an angle of six centigrades.

To simplify ordering, we have numbered them consecutively from 1 to 102, as shown by the bold-faced type under the illustrations, which also bear the descriptive figures. The instruments themselves also bear these figures and our numbers, the latter stamped upon the shaft near the end, as shown in the illustration of No. 1.

Made only on octagon file-cut steel handles, as shown.



Ordinaries—Hatchets

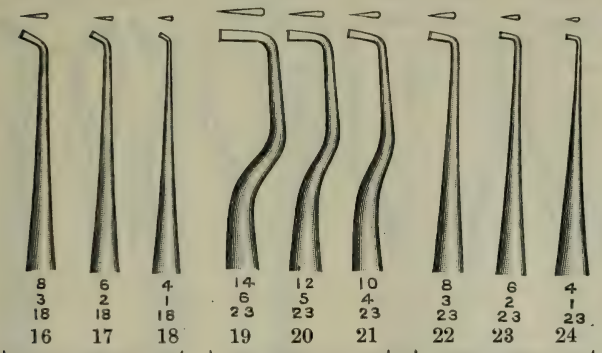


12 5 6	10 4 6	8 3 6	6 2 6	4 1 6	14 6 12	12 5 12	10 4 12	8 3 12	6 2 12	4 1 12	14 6 18	12 5 18	10 4 18
2	3	4	5	6	7	8	9	10	11	12	13	14	15
$3.50 doz.											$3.75 doz.		

CUTTING INSTRUMENTS

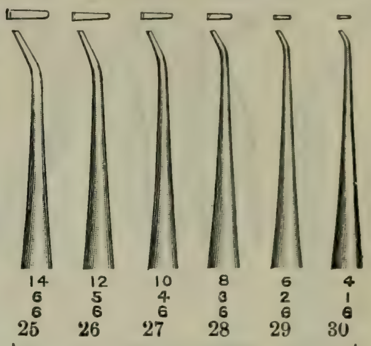
BLACK'S SYSTEM—(Continued)

Ordinaries—Hatchets



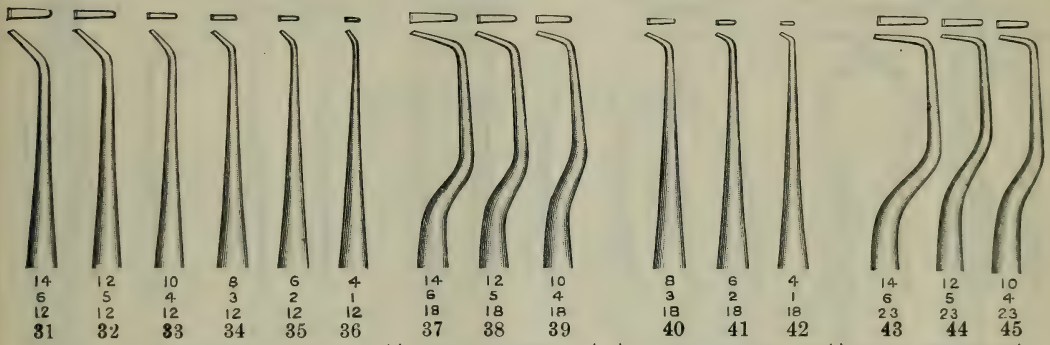
$3.50 doz. $3.75 doz. $3.50 doz.

Ordinaries—Hoes



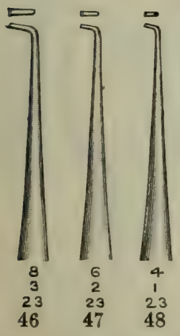
$3.50 doz.

Ordinaries—Hoes

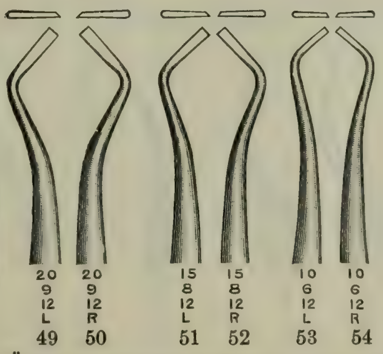


$3.50 doz. $3.75 doz. $3.50 doz. $3.75 doz.

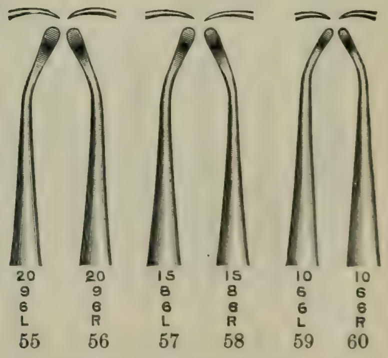
Ordinaries Hoes



Specials Enamel Hatchets



Specials—Spoons

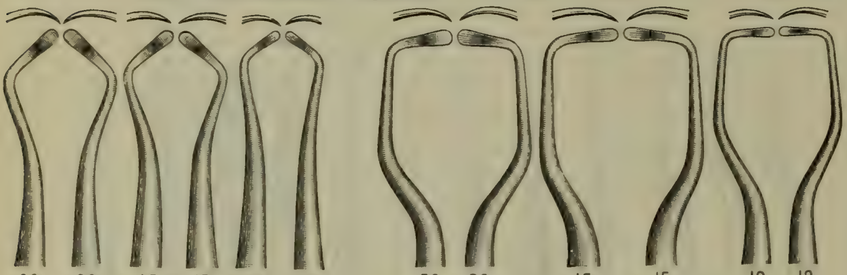


$3.50 doz. $4.25 doz.

CUTTING INSTRUMENTS

BLACK'S SYSTEM—(Continued)

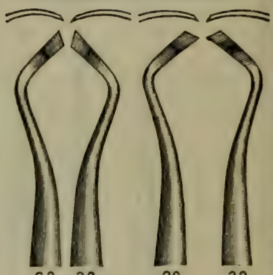
Specials—*Spoons*



$4.25 doz.

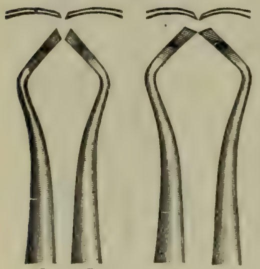
$4.50 doz.

Gingival Margin Trimmers



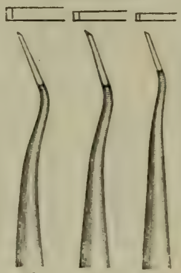
$4.25 doz.

Gingival Margin Trimmers



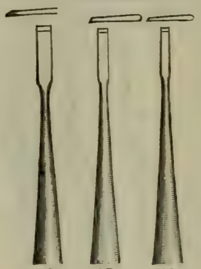
$4.25 doz.

Bin-Angle Chisels



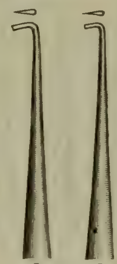
$4.50 doz.

Straight Chisels



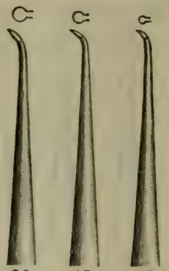
$4.25 doz.

Side Instruments



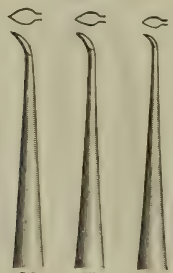
$3.50 doz.

Discoids

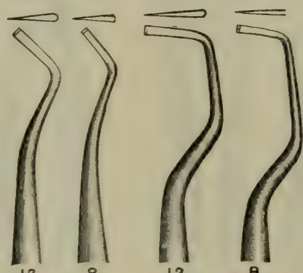


$3.75 doz.

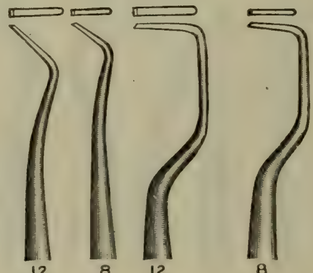
Cleoids



Long Hatchets



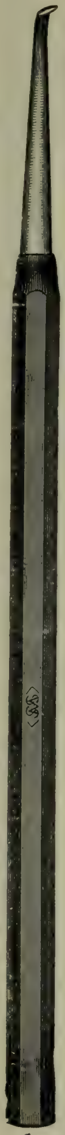
Long Hoes



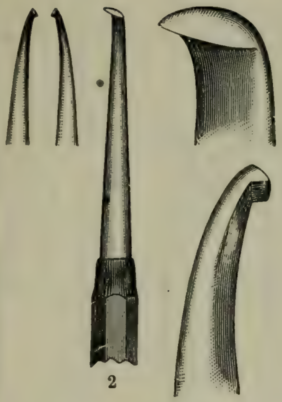
$3.75 doz.

ENAMEL CLEAVERS

Patterns furnished by Dr. Calvin S. Case



1



2

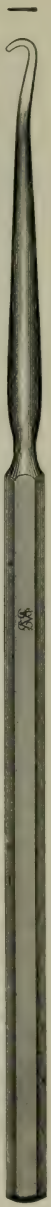
DEVISED to overcome the difficulty of removing enamel which is practically unbroken. They "can be partially rotated under the margin of the gum, presenting a sharp point toward portions of the enamel that will not easily cleave off, with a view to fracturing it as the diamond cuts glass, breaking it up into small particles which can be quickly detached and the sides straightened and smoothed by the broad blade."

The peculiarities and practicability of shape of the instruments are shown in the enlarged illustrations. Tempered to take hold of the hardest enamel. Securely fixed in handles similar to our No. 10A Cone-Socket Handle. Right and Left.

Price, per pair, $1.20	**each $0.60**
Points separately	**" .35**

Ligature Cutter

Suggested by Dr. Garrett Newkirk



THIS device for the quick and safe cutting of the ligatures holding the rubber dam around the necks of the teeth, after the completion of a filling operation, made its way promptly to popularity years ago because of its practical usefulness.

The working end is fashioned into a hook or curved knife blade, with a keen edge. The blade is thin, as shown in the outline illustration, and the extreme point is blunt to permit it to be inserted under the ligature without risk of injuring the gum or puncturing the rubber dam. With the point inserted, a slight pull cuts the ligature.

Price, Octagon Steel Handle	**$0.35**
" Cone-Socket Point	**.25**

Aseptic Doilies

THE Aseptic Doily is a little "individual" napkin, 6 x 6 inches, for the dental office, which is thrown away when removed from the patient's mouth. Made of cloth prepared by the special treatment used in finishing aseptic gauze for hospital work.

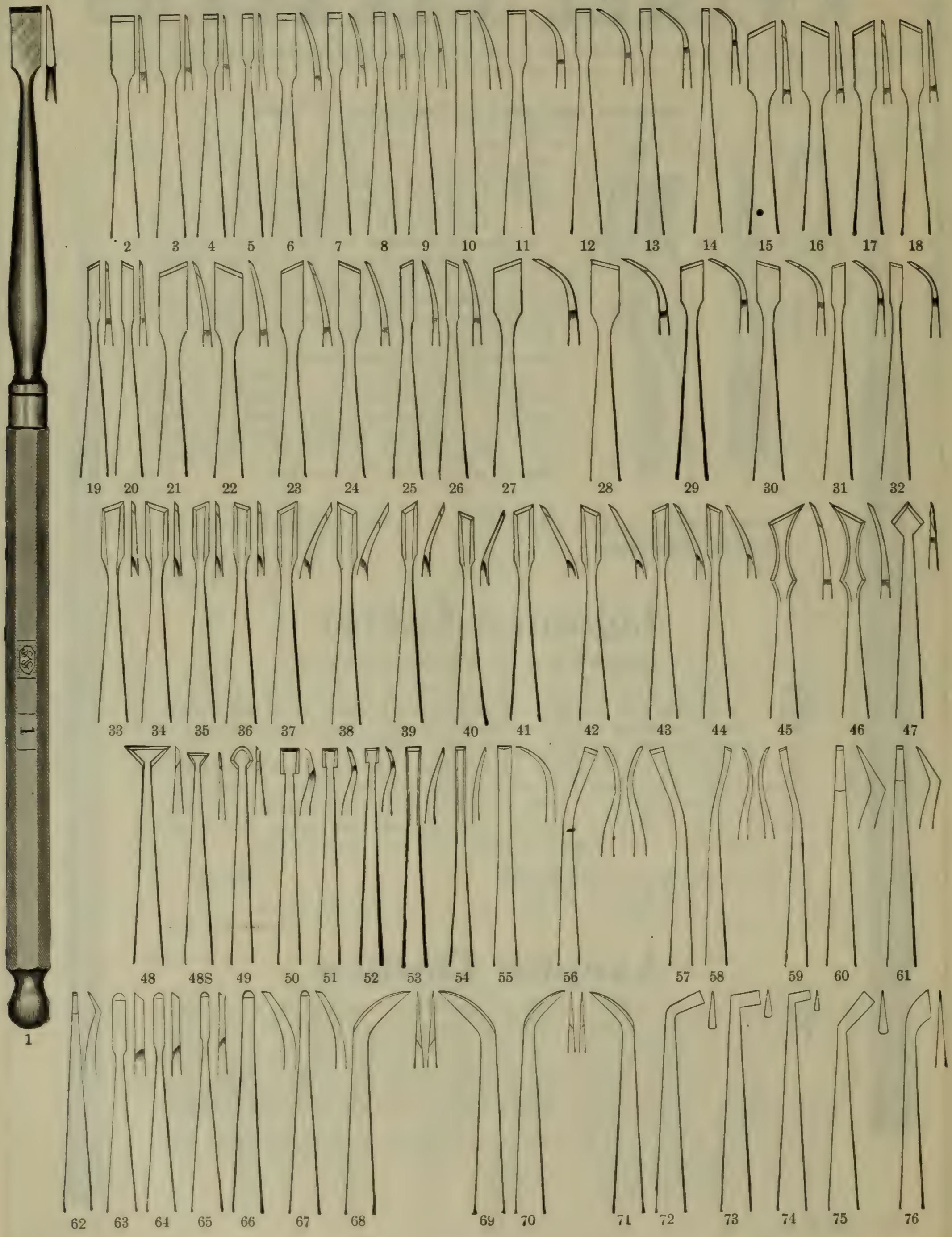
No lime, acid, or other objectionable material is used in the bleaching. The Doilies are freed from foreign matters and are carefully sterilized before being packed for sale.

The price is so low as to make the use of this Doily cheaper than that of the ordinary forms.

Put up in boxes of 50 and 500.

Per box of 50	**$0.20**
" " " 500	**1.50**

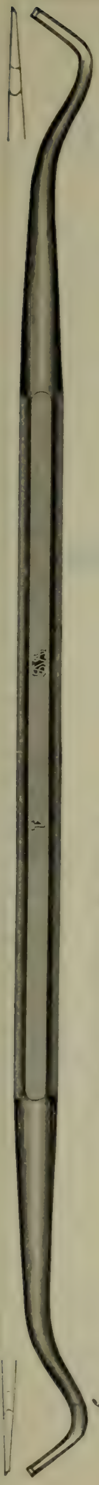
CHISELS The S. S. WHITE DENTAL MFG. CO.'S Selection of 77

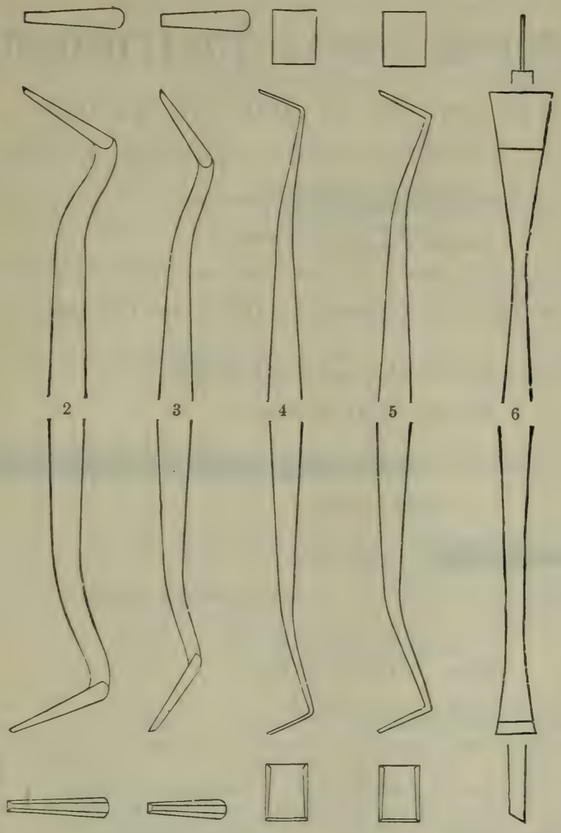


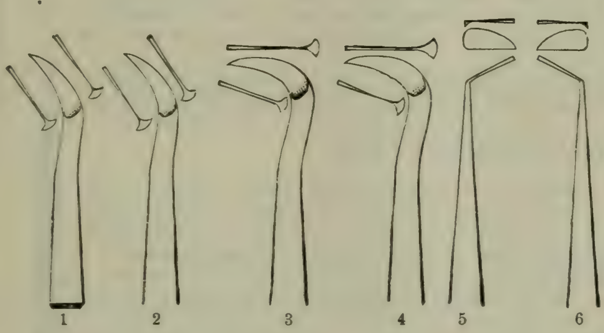
PRICES

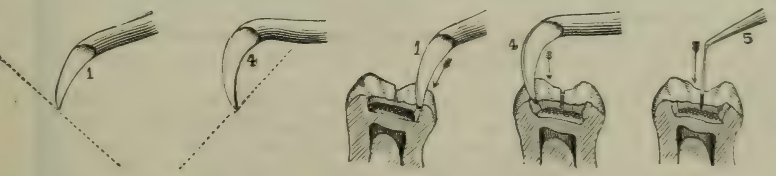
File-cut Handles . . . . each	$0.50
Cone-Socket Points . . . . "	.35

CHISELS CONTINUED









BROWN'S "HEROIC"

THIS set of instruments is designed to do nearly all the heavy trimming away of enamel, both on the exposed surfaces of the teeth and on their approximal surfaces. Several of the points are also valuable for scaling calculus and removing stains.

The forms of the heavy points will explain their uses, for "heroic" chiseling; the thin blades only to be used where necessary on account of limited space between the teeth.

Made only on Octagon Steel Handles

PRICES

Nos. 1, 2, 3 . . . . . each $1.50
" 4, 5, 6 . . . . . " 1.60

DR. HOW'S FISSURE

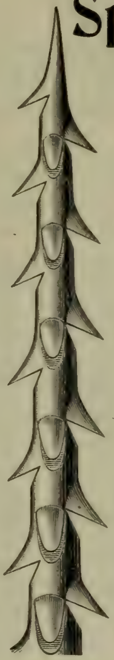
MADE very hard and very thin, with the *inner* edges of Nos. 1 and 3 thicker than their *outer* edges, while Nos. 2 and 4 are thickest at their outer edges. They cut only on the floor of a fissure and deepen it without wasting time or force on the *sides*. A groove is thus quickly cut with nearly square walls for the retention of the fillings. Nos. 5 and 6 are right and left, for cutting lateral fissures in like manner. See the supplemental illustrations, which also show the angle for a slight bevel of the cutting-end after it has been given a wedge-point. The instruments will also serve as superior scalers.

Price, ¼-in. File-cut Long Handles . . . . each $0.65
" Cone-Socket Points . . . . " .50

DONALDSON'S

Spring-Tempered Nerve Instruments

MADE BY DR. R. B. DONALDSON



Trade-Mark
Registered

MARQUE DE FABRIQUE
Muster —DONALDSON— Schutz
Déposée en France.
Geschützt im Deutschen Reich.

In U. S.
Patent Office

NOW MADE OF TWO MATERIALS, STEEL and 18K GOLD

PULP-CANAL CLEANSERS

Four Varieties

LONG HANDLE

SHORT HANDLE

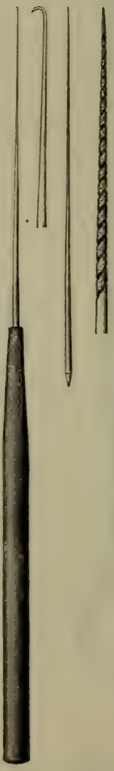
LONG WITHOUT HANDLE

SHORT WITHOUT HANDLE

THE Donaldson Pulp-Canal Cleansers are made of tough steel piano-wire; they have the tenacity to withstand any necessary strain put upon them.

The barbs are cut upon a definite plan, with precision, and not haphazard. They are long and sharp, each barb with a rather pronounced slant backward, and they are arranged in a regular spiral, forming in effect, a broken screw-thread. (See enlarged view.) Entered into the canal by a screw-motion, the Cleanser readily penetrates the pulp-substance, which is brought away by the backward-pointing barbs locking in it when the Cleanser is pulled out. Should the Cleanser become "jammed," a backward turn or two (unscrewing) at once releases it.

Their construction makes clear the reasons why these Cleansers are so far superior to any other device for the purpose so far brought before the profession.



NERVE-BRISTLES

The Spring-Tempered Nerve-Bristles are made of steel piano-wire and their temper may be described as a "soft spring." Ordinarily, that is, when lightly pressed, they are springy and resume their shape on the removal of the pressure; but with increase of the force put upon them they bend. Their toughness is remarkable when their extreme tenuity is considered. They are as thin as actual bristles, so that they will enter the narrowest canal, and at the same time they are so tough that they will follow its most tortuous windings without breaking.

Made in three forms, hooked, roughened, and plain, and sold with handles and without for use in the broach-holder.

The hooked Bristles are extractors for removing pulps, more especially remnants near the apex, to grasp and release which from the walls the minute, sharp hook is especially adapted.

The plain and roughened varieties are dressing Bristles. They carry a shred of cotton readily to the apex for drying out or medicating the surfaces. The plain form is for use when the medicament is to be left in place, the roughened when the cotton is to be removed at once after wiping the walls of the canal.

For Sizes and Prices see opposite page

Donaldson Instruments

are put up in boxes and packages each containing a half-dozen instruments designated as follows:

PULP-CANAL CLEANSERS

FIVE SIZES EXTRA FINE FINE BETWEEN FINE AND MEDIUM MEDIUM LARGE

Fine and Extra Fine also made "SHORT CUT" or BARBED ONLY FOR A SHORT DISTANCE

Box			Package		
No. 1	Long handle.	Assorted sizes	No. 4	Long without handle.	Assorted sizes
" 2	" "	All fine	" 4	" " "	All medium
" 2	" "	All medium	" 5	" " "	All Fine
" 3	Short handle.	Assorted sizes	" 5	" " "	Extra fine
" 3	" "	All fine	" "B"	" " "	Between fine and medium
" 3	" "	All medium	" 6	Short " "	Assorted sizes
			" 6	" " "	All Fine
			" 6	" " "	All medium

PRICES

CLEANSERS	Steel (unplated) without handles	per half doz. $1.25;	each $0.25
	" " with handles	" " " 1.75;	" .30
	18K Spring Gold without handles only......	" " " 3.50;	" .60

The latter are made only in fine, medium and large, the packages being either assorted, all fine, or all medium.

NERVE-BRISTLES

No. 1. Four hooks and two roughened (handles)	All roughened (handles)
" 2. All hooks (handles)	All plain (handles)
" 3. Four hooks and two roughened (no handles)	All roughened (no handles)
" 4. All hooks (no handles)	All plain (no handles)

PRICES

BRISTLES	Steel (unplated) without handles..........	per half doz. $0.75;	each $0.15
	" " with handles	" " " 1.25;	" .25
	18K Spring Gold without handles only.....	" " " 3.25;	" .55

The latter are made in the plain (without hook) only, in fine, medium and large. Packages of all one kind only.

Special Notice

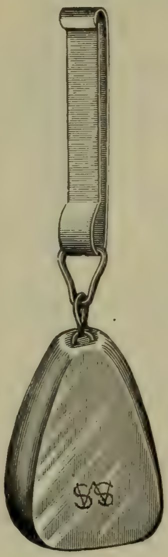
Imitations of the Donaldson Pulp-Canal Cleansers and Nerve Bristles are made in Europe and put up under labels which in color and general character of type-work sufficiently resemble the labels of the genuine to deceive the unwary.

To guard against imposition Dr. Donaldson has registered his trade-mark in the United States, France, and Germany.

Every box or package of genuine Donaldson Instruments bears the trade-mark which consists of the word DONALDSON crossed by a cleanser.

The S. S. WHITE DENTAL MFG. CO., Sole Agent

RUBBER-DAM WEIGHTS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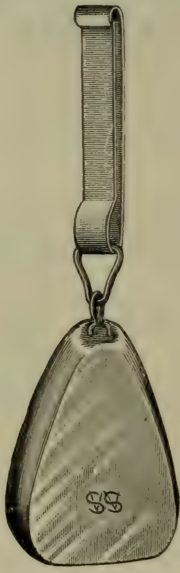
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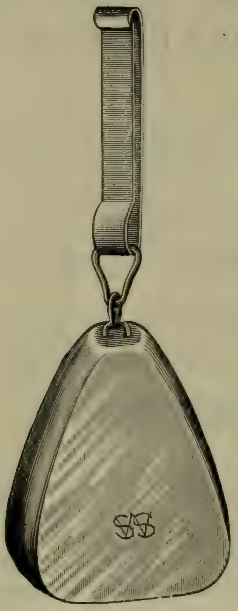
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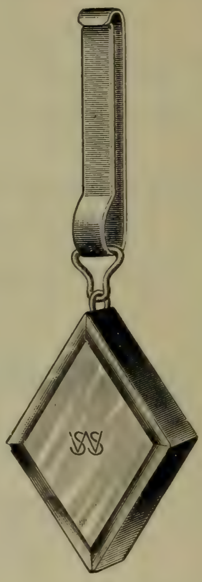
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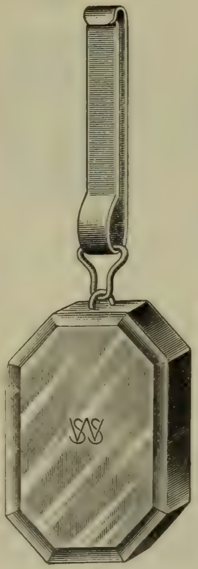
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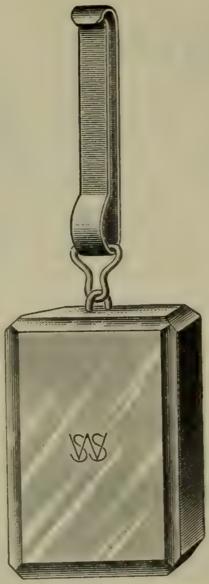
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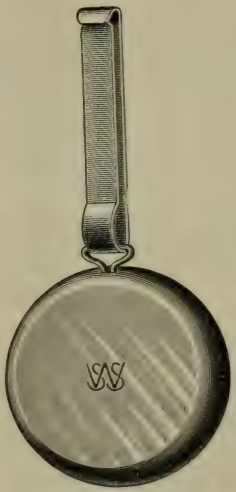
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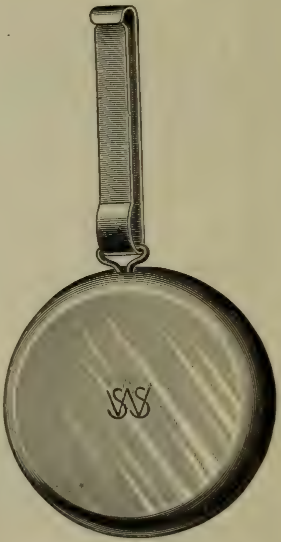
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We add a new shape, the circular, in two sizes, to our line of Rubber-Dam Weights, to be known as Nos. 7 and 8. These will doubtless meet prompt recognition for their advantages.

The various sizes and forms of our Rubber-Dam Weights are made of brass, nickel-plated, with nickel-plated spring clips for suspension.

PRICE

Rubber-Dam Weights, Nos. 1 to 8 . . . . each $0.50

Get Out of the Rut

YOU can fill a tooth faster with so-called "soft" gold than with cohesive, because you can use it in larger pieces. Yet in the filling of cavities much more cohesive gold is used than non-cohesive or soft. Why? Largely because you can make a denser filling, with a harder, more resistant surface.

But you can fill that same tooth faster with Moss Fibre than you can with "soft" gold, in spite of the fact that you have to use the Moss Fibre in very small pieces, like cohesive foil, and the filling when completed will be at least as dense and resistant as if made of cohesive foil.

Now, why, if Moss Fibre combines the fast work of soft foil, with the enduring results of cohesive foil, why, in the name of common sense, should it not be used instead of foil?

Isn't it because most men, including dentists, are largely creatures of habit? You have got used to working cohesive foil, and you don't care to change. Being used to cohesive foil is a good habit,—there is nothing to be said against it. But many of you would make more money, because you could do faster work; and give as lasting satisfaction to your patrons, because the work would stand every test at least as well,—if you used Moss Fibre. If you once tried it,—following the directions and humoring its peculiarities,—you would think so too.

You can test its working qualities at small cost, $1.00 for 12 grains—enough for two or three small fillings.

Price	per ⅛ oz. $4.00
" in ½-oz. lots, or more	" oz. 30.00

Factory-Made vs. Home-Made Gold Cylinders

ONE advantage of Pack's Gold Cylinders over gold foil rolled as the dentist does it for himself is that they are always even and uniform. Just so many turns, just so long.

Another advantage is that the foil is crinkled, so that until pressure is applied the layers touch only at points instead of presenting smooth surfaces to snuggle up close to each other.

A third advantage is that the rolls are very loose,—fewer layers to a given size and requiring comparatively little pressure for perfect condensation.

The quality is high, the price low,—made so to favor the consumer.

Made of No. 4 Foil, in two varieties,—SEMI-COHESIVE CRYSTAL FOIL LOOSE-ROLLED CYLINDERS—SOFT CRYSTAL FOIL LOOSE-ROLLED CYLINDERS.

Six sizes. Put up in ⅛ oz. boxes (Nos. ¼, ½, ¾, 1, 2, 3, and assorted).

The box makes them open to inspection and preserves them unimpaired.

Price	per ⅛ oz. $3.50
" lots of ½ oz. or more	" oz. 27.00
" Sample package for testing	" $\frac{1}{32}$ oz. 1.00

If your dealer won't supply them, we will.

THE S. S. WHITE DENTAL MFG. CO.'S GOLD FOIL

OUR Gold Foil has now been before the dental profession for over six years in its present form, as a single standardized product combining all the useful qualities possible in a foil. That it has met the needs and fulfilled the claims made for it when it was first announced is evidenced by its continually growing sales. Carefully worked out to combine all the qualities which had made the popularity of three of the largest selling foils before the profession, it is believed that every useful quality known to gold foil is here presented.

The two forms—Cohesive and Soft (or Non-Cohesive)—and the various numbers cover every need in foil-filling, whether by hand pressure or mallet force, whether used as cylinders, ribbons, or ropes.

The distinctive merits of this Foil are its purity and its softness in working. It is made of gold as near absolute in purity as science and skill can command. No impurity, appreciable to any known test, is to be found in it. The processes through which it is put preserve the native characteristics of the metal which are most useful to the dentist,—its softness and cohesiveness. As a result of this perfect conservation of its softness, the foil works under the plugger-point with a peculiar lead-like quality, whether the Cohesive or the Soft form is used. This softness enables the operator to put the foil just where he wishes to and to manipulate and form it as he has need to. The adaptability of the Non-Cohesive Foil is so perfect that with it the highest type of filling possible with "Soft" Gold is readily made.

In the Cohesive Foil, the cohesiveness is only partially developed, to about the degree liked by the majority of operators. Annealing it will still further develop this quality, to any desired extent.

In the Soft variety the cohesiveness is masked, so that cylinders rolled from the gold as sold will slide upon one another without the slightest tendency to cohere. The cohesiveness may, however, be restored by proper annealing.

Nos. 3, 4, 5, and 6, Soft and Cohesive, carried in stock; heavier numbers supplied on order. We also carry in stock Rolled Gold Foil, cohesive only, in the Nos. 20, 30, 40, and 60.

Put up in white envelopes bearing this legend:

ONE EIGHTH OUNCE
GOLD FOIL
The S.S. White Dental Manufacturing Co.
No. 4 COHESIVE

(Fac-simile of legend on envelope)

Price . . . . **per ⅛ oz. $3.50**
" . . . . **½ oz. or more, per oz. 27.00**

DR. WESSELS'

NON-CONDUCTIVE CAVITY LINING

THE excavation of a carious cavity in a tooth, if the caries extends any appreciable distance into the dentin, removes by so much the natural protection of the pulp. The danger to the pulp from a metal filling in such a cavity is so great that proper practice requires that the cavity be lined with a non-irritating non-conductor.

Dr. Wessels' Cavity Lining has all the useful properties for this purpose.

It is non-conducting, non-irritating, impermeable to moisture, "sticky," and easily applied. It dries quickly, so that no delay is caused by its application. It has shown itself a reliable fender for the pulp through several years of wide-spread use, protecting it against thermal shock from metal fillings, or the possible devitalizing influence of some kinds of cement fillings in deep cavities. It penetrates the dental tubuli, and being a germicide, aids in preventing further decay.

Its principal uses are:
As a cavity lining.
As a covering for exposed pulp.
As an aid in starting a gold filling.

Retaining pits and grooves, which are often a menace to the life of the pulp, can be dispensed with. The cavity simply needs to be made retentive in shape. The very sticky nature of the Cavity Lining insures the retention of the first piece or few pieces of gold to the floor and walls of the cavity at the proper place, and the filling is built upon this just the same as from a retaining pit or groove.

It has other minor uses,—for stopping a leak in rubber dam; for holding wedges in place; for preventing gutta-percha from drawing out of the cavity when finishing, or for keeping cement fillings dry until they have set hard.

Put up in ½-oz. ground-glass-stoppered bottles.

Price . . . . **per bottle $0.35**

Gutta-Percha Stoppings

With the three Gutta-Percha Stoppings described below we believe we meet all the needs of the dental office for this form of filling-material.

All of them are well known, as witness:

"Excelsior" Gutta-Percha—High-heat.
"Premium" Gutta-Percha—Medium-heat.
Temporary Stopping—Low-heat.

High-heat and Medium-heat Gutta-Perchas are for work more or less permanent in character, because of their lasting qualities. As to which is to be used preferably in a particular case, that is a matter to be decided by the individual taste of the operator. Either will answer the purpose of a reliable filling, as Gutta-Percha fillings go.

Low-heat Gutta-Perchas are for temporary work, as the sealing in of medicaments or the temporary stopping of a cavity while the fitness of the tooth for permanent filling is in abeyance.

"Excelsior" Gutta-Percha

"Excelsior" Gutta-Percha, our High-heat variety, is well known to dentists, having been largely used by them for years. It softens at 225° F., is very dense, stands wear well, even when exposed to considerable attrition, and really comes near to being a permanent filling-material.

Put up in sticks and pellets, in ¼-oz. ½-oz. packages.

Price . . . . **per oz. $1.00**

"Premium" Gutta-Percha

A very old variety, first put before the profession thirty years or more ago. A Medium-heat Gutta-Percha; softens at 208° F. Excellent for the interior of cavities, more especially those which approach the pulp closely. Has found extensive use in such cases under gold fillings. Good also for the entire filling where the surface is exposed to little wear.

Put up in sticks and pellets, in ¼-oz. and ½-oz. packages.

Price . . . . **per oz. $1.00**

Open a Box

of ◈ Temporary Stopping and you are at once prepossessed in its favor by its appearance. It is good to look at and, what is better, it is good to work with. You pack it comfortably for the patient. It does its work faithfully—seals the cavity surely. When you are ready to remove it you remove it readily.

Made in sticks, pink and white, and sold in boxes with all white or all pink or both colors.

Price . . . . **per box $0.30**

HILL'S STOPPING

HILL'S Stopping is always the same. Probably no composition filling was ever made with less variation in quality. It has been longer before the profession than any other gutta-percha preparation for filling teeth.

From about 1855 on it has made and held its reputation. Other excellent gutta-percha preparations have come up and made their place in the world, but they have not lessened the esteem felt by many operators for Hill's Stopping, which still has a large sale.

Put up in half-ounce, quarter-ounce, one-tenth-ounce, and one-twentieth-ounce boxes.

Price . . . . per oz. $5.00

HALF-OUNCE.

TRADE-MARK.

HILL'S
STOPPING.
A. Hill D.D.S.

Registered May 11, 1875.

The S. S. White Dental Mfg. Co.,
SOLE AGENT,
Philadelphia, New York, Boston, Chicago,
Brooklyn, Atlanta, Rochester, Berlin,
Buenos Aires, St. Petersburg, Toronto.

BEWARE OF COUNTERFEITS!
The genuine is sold (in any quantity) in Sealed Packages only, bearing the above TRADE-MARK.

Made in U. S. A.

Small Rubber Ligatures for Reciprocating Regulation

The application of reciprocating force from one jaw to the other—the principle which is revolutionizing the correction of irregularities—requires for its execution rubber ligatures which can be depended upon to be tough and to have plenty of "pull."

The ligatures here offered are extremely tough and very durable. They are specially made of rubber carefully selected to provide these requisite qualities.

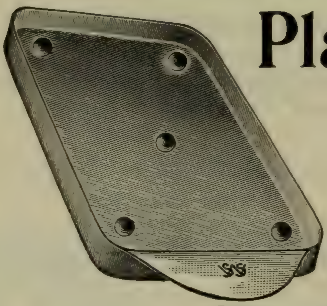
Incidentally they are applicable with all the advantages of their greater strength and durability wherever small rubber ligatures are used.

Price . . . . per box $0.60

THE S. S. WHITE DENTAL MFG. CO., Sole Agent

Platinum Fusing Pans

Advanced



Large

Medium

Small

THE advantage in using Platinum Fusing Pans is that they permit such quick work. These Pans for fusing porcelain work are stamped up of platinum. They hold the silex on which the work rests without risk of spilling. One end is bent over and extended in the form of a lip for convenient handling. They are but little affected by the heat of the furnace, and last a long time.

Three sizes, Large, Medium, and Small. The large is 1⅜ inches wide, 1¾ inches long, ⅛ inch deep; the Medium, 11/16 x 1 7/16 x ⅛ inch; the Small, 11/16 x ⅞ x ⅛ inch.

The Large size will carry bridges up to six or eight teeth, and can be used in the large muffle of the No. 2 or in the Nos. 3 and 4 Hammond Furnaces.

The Medium will carry crowns or bridges up to three or four teeth.

The Small is for inlays, crowns, and small bridges, of say two teeth. The Medium and Small can be used in the muffle of the No. 1 Hammond Furnace.

Price, Large	$9.00
" Medium	3.75
" Small	2.70

Prices subject to fluctuations of Platinum.

TRADE-MARK

ZINCOID CEMENT

Reg. in U. S. Pat. Off.

Not a Tooth-Filling Cement

A NEW cement, not for filling teeth but devised specially for securing Dental Inlays, Crowns, Bridges, and Orthodontic Fixtures.

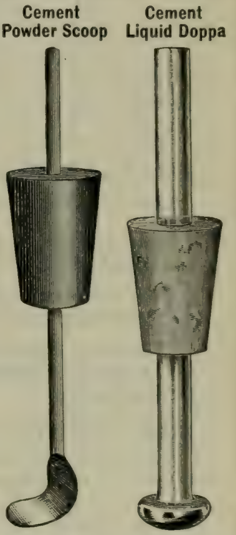
Made in the following colors: White, Light Yellow, Light Gray, Yellow-White, and Blue-White, giving sufficient range of shades to match any inlay so closely that there will be no danger of the cement affecting the appearance of the porcelain when in place.

The success of a porcelain filling or of a crown depends finally on the holding quality of the cement; with Zincoid Cement, if the directions are closely followed, the result is sure.

PRICES

Package of six colors and liquid		$1.50
Powder, separately	per bottle	.25
Liquid "	" "	.30

THE S. S. WHITE CEMENT POWDER SCOOP AND LIQUID DOPPA



THESE two little devices enable the dentist to avoid soiled fingers and waste of material in using cements. The Scoop will ladle out the powder just as it is wanted, and the Doppa, having a capacity of one-third of a drop, will deliver the liquid without any danger of contamination or waste.

The corks are adjustable to the height required and sit lightly in the necks of the bottles, so it is not necessary to touch the bottles when removing the ingredients for a filling. They combine convenience, cleanliness, cheapness, celerity, and economy.

Two sizes of corks, Nos. 1 and 4.

PRICES

WITH EITHER SIZE CORK

Powder Scoop	each $0.05;	per doz. $0.50
Doppa	" .05;	" .50

"THE OLD RELIABLE"

LAWRENCE'S AMALGAM

RES NON VERBA
LAWRENCE
TRADE MARK

WITH a single exception, Lawrence's is the oldest amalgam now on the market. That it has endured through forty years or more of widespread use is strong testimony to its character.

Lawrence's Amalgam is always put up in a white lithographed envelope covering a brown one containing the amalgam, with Trade-Mark on the flap of each, and both copyrighted. Put up in ⅓-oz., ½-oz., and 1-oz. envelopes.

PRICES

1 oz....$3.00	2 oz....$5.50	4 oz...$10.00	10 oz...$20.00	20 oz...$35.00

THE S. S. WHITE DENTAL MFG. CO., Sole Agent

Gold Plates, Gold Solders, Platinum Plates, Etc.

GOLD SOLDER

The S. S. White Dental Manufacturing Co.

Philadelphia - New York - Boston - Chicago
Brooklyn - Atlanta - Rochester - Berlin
Buenos Aires – St. Petersburg - Toronto

CHARACTERISTICS

The characteristics of our Gold Plates and Solders are—

The plates of any given karat are always the same in color and working qualities, and give the same results under the same manipulation.

The solders run like water, and are so clean that you can see where they are running and what they are doing all the time.

Working a given karat of Plate with the corresponding karat of Solder, the fusion is perfect, the joint invisible, and the strength of the soldered piece homogeneous.

THE NEEDED QUALITIES SUPPLIED

These three sentences express clearly the reasons why our Plates and Solders are preferred by the thousands of crown- and bridge-workers who are acquainted with them; why every dentist who is not already using them should test them. They have the needed qualities in greater perfection than can be found elsewhere.

THE STANDARD FOR TWENTY-ONE YEARS

Our Plates and Solders were introduced in their present standardized form in 1885, to meet the needs of crown- and bridge-workers. Then, and not till then, the dentists found certainty in the working of plates and solders. The traits which made their introduction and epoch in the construction of crowns and bridges are maintained by painstaking care in every step of their preparation. Purity of metals and exactness of manipulation are the formula for their production.

THE KARAT MARK

The karat mark on our Gold Plates is absolute. It tells the fineness of the Plate truthfully. The variation from the mark is never more than the thousandth part of a karat. The mark of our Gold Solder indicates the karat of the Plate with which it is intended to be used.

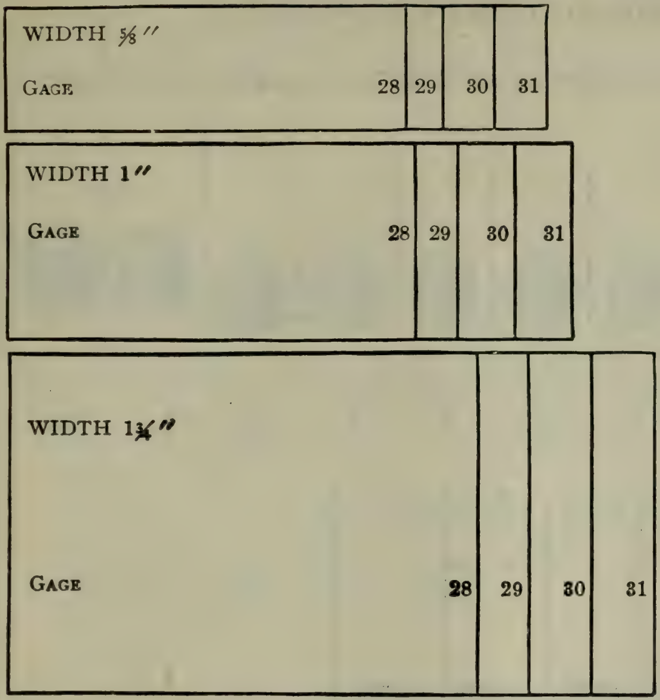
Gold Plates sold in any quantity, size, or shape desired; also, in 3, 5, and 10 dwt. lots, as shown by diagrams on opposite page.

Gold Solder sold in envelopes, in any quantity from 1 dwt. up.

For prices see opposite page

Prices of Platinum products subject to changes according to the fluctuations of platinum.

Gold Plates, Gold Solders, Platinum Plates, Etc.—(Continued)



As a possible help in ordering, we show here approximate lengths of 22-K. Gold Plate in widths of ⅝, 1, and 1¾ inches for gages 28, 29, 30, 31, weighing respectively 3, 5, and 10 dwts.

Gold Plates

		Retail
24-K	per dwt.	$1.13
Coin	"	1.05
22-K (Light or dark shade)	"	1.05
20 "	"	.97
18 "	"	.87
Clasp	"	1.00
Crown Metal Gold and Platinum		(Price fluctuates)

Wires, Springs, Etc.

Gold Wire, Round, 18-K	per dwt.	$0.93
" " Half Round, 18-K	"	1.00
" " Round, 20-K	"	1.00
" " Half Round, 20-K	"	1.06
" Clasp Wire, alloyed with platinum	"	1.07
Gold Ligature Wire	"	1.25
" Spiral Springs, 10-K	each	1.00
" " " 18-K	"	2.00

Gold Solders

		Retail
For Coin Gold Plate	per dwt.	$0.96
" 22-K " "	"	1.00
" 20 " " "	"	.95
" 18 " " "	"	.85
" 16 " " "	"	.75
" 14 " " "	"	.65

Platinum

Plate, Hard or Soft	Prices fluctuate
Wire, Hard or Soft	

Platinum Solder

Gold 75 %, Platinum 25% (Price fluctuates)

Silver

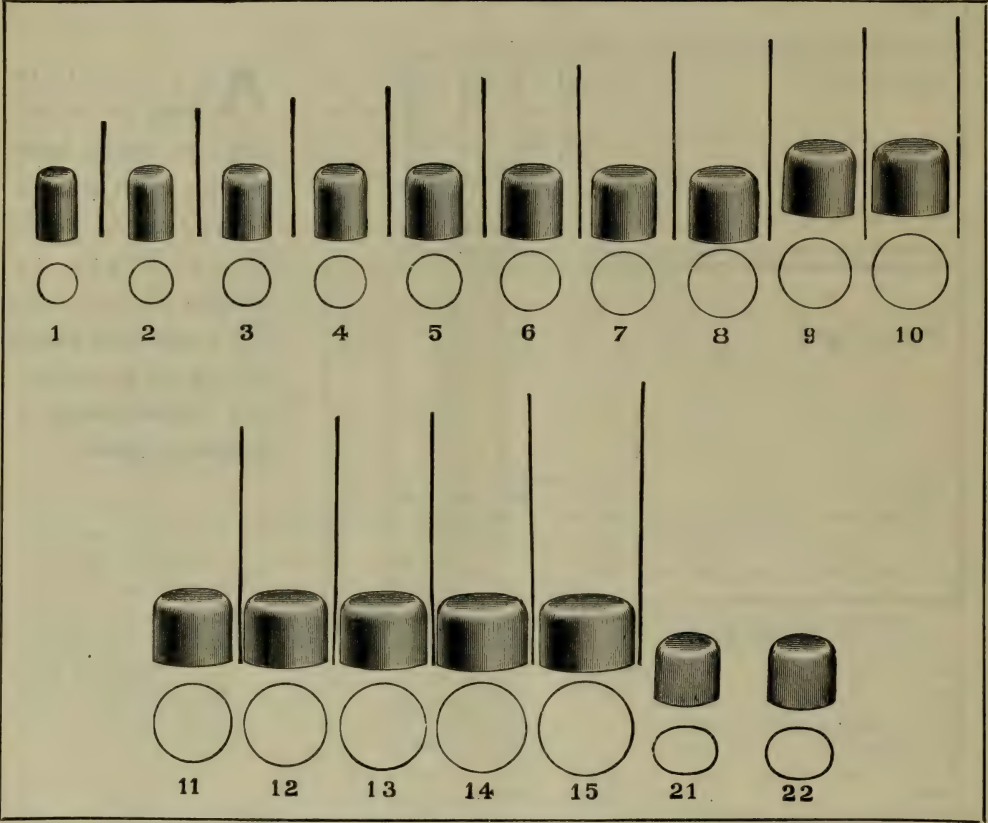
Plate, Coin	per oz. $1.00;	per dwt. $0.07
" Pure	" 1.00;	" .07
Solder	" .85;	" .05
Spiral Springs		each .30
Wire, Coin	per oz. $1.60;	per dwt. .10

PRECIOUS METALS STRICTLY CASH

◈ GOLD PLATES, GOLD WIRES, and GOLD SOLDERS, in lots of one ounce or more, will be sold FOR SPOT CASH, at 5 cents per pennyweight ($1.00 per ounce) less than the prices above quoted.

SEAMLESS GOLD SHELLS, 22-Karat

FOR MAKING CROWNS



THESE Gold Shells are ready to be swaged and contoured into perfect Crowns.

Nos. 1 to 15 are round, ranging in regular gradations from the smallest to the largest size needed, each succeeding number having a diameter .02 of an inch greater than the size next smaller.

The inside circumference of each shell is accurately shown by the line to its right.

Nos. 21 and 22 are elliptical in form, corresponding in size with Nos. 5 and 6.

Made seamless of 22-karat Gold Plate, and in three lengths, ¼-inch, ⅜-inch, ½-inch.

The crowns are of No. 29 gage and the side walls of No. 30 gage.

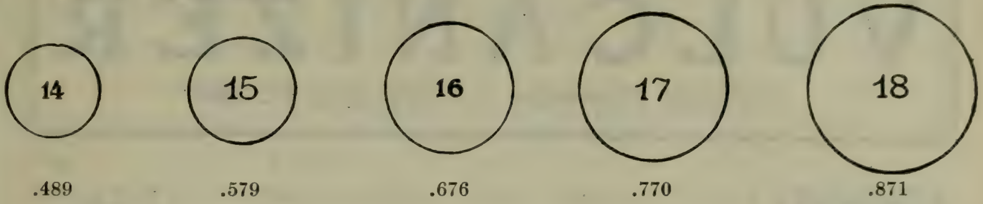
Price . . . . per dwt. $1.07

◈ GOLD SHELLS and GOLD DISKS (see opposite page), **in lots of one ounce or more, will be sold FOR SPOT CASH, at 5 cents per pennyweight ($1.00 per ounce) less than the prices here quoted.**

22-KARAT GOLD DISKS IN GAGE 30

These disks are carefully and exactly made. Gages and diameters are exact, and the Plate has nearly the softness of pure Gold, with the necessary strength.

Numbers and diameters:



Price . . . . **per dwt. $1.05**

BORAX THE FLUX FOR DENTISTS

Borax in some form is the practically universal flux in dental soldering operations. It may be used in the crystal form—lump or powdered—or as a calcined powder. Usually the borax which the dentist uses is powdered. It may or may not be calcined, and it may or may not be put up in stick form. We sell it in all these ways.

POWDERED BORAX

Plain Powdered Borax Crystals are largely used in ordinary soldering operations, though this form is not suitable for fine bridge-work.

Put up in wood boxes.

Price . . . . **per box $0.08**

CALCINED BORAX

Calcined Borax has advantages over the powdered crystals, in that, having parted with the water of crystallization, it does not boil up when melting and push the bits of solder out of position. This boiling up of the powdered crystals is really the stage of calcination, through which the Borax must pass before it melts down and runs over the solder and joint. It is the same way when lump Borax is rubbed down on the slate. The calcined form has been through this stage, and merely melts down to its work. Even when the calcined Borax is mixed with water to form a paste, the water does not combine with the Borax chemically, and hence is readily given up on the application of heat, with the minimum of bubbling.

Put up in wood boxes.

Price . . . . **per box $0.15**

COMPRESSED BORAX

Compressed Borax affords a clean flux for soldering operations in a convenient form. Great pains are taken in the preparation to eliminate every form of impurity from the Borax, which is calcined. Put up in form of cylinders, 2 inches long by ¾-inch diameter, covered with foil. Used by rubbing off as desired on the "Borax Slate." An unequaled flux; a clean way of using it; no waste.

Price **$0.10**

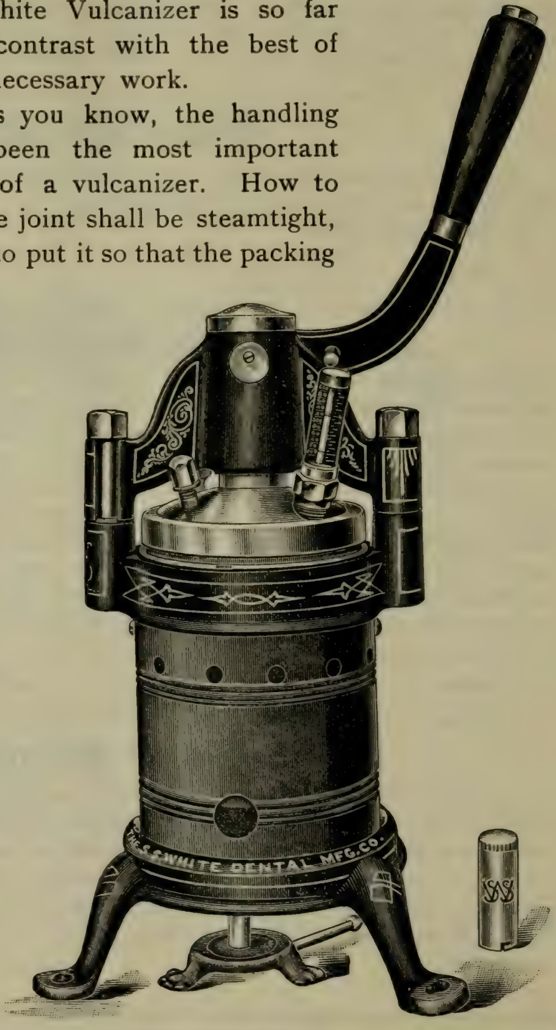
THE S. S. WHITE
VULCANIZER

Patented November 15, 1898; July 17, 1906

ATTAINED at last—what every manufacturer of vulcanizers has been struggling for these twenty years or more—the perfect apparatus. That is the one word—P-E-R-F-E-C-T—which describes the S. S. White Vulcanizer. There are vulcanizers which vulcanize,—that isn't the point. But every one of them makes a lot of unnecessary work, and that *is* the point wherein the new S. S. White Vulcanizer is so far superior that it makes a contrast with the best of them. It saves *all* the unnecessary work.

It is just this way: As you know, the handling of the cover has always been the most important thing in the manipulation of a vulcanizer. How to seat the lid of the pot so the joint shall be steamtight, how to get the lid off, where to put it so that the packing won't pick up grit or dirt to spoil the fit. These are the problems which have been bothersome, and you've seen many devices more or less complicated which tried to solve them. But they haven't done it.

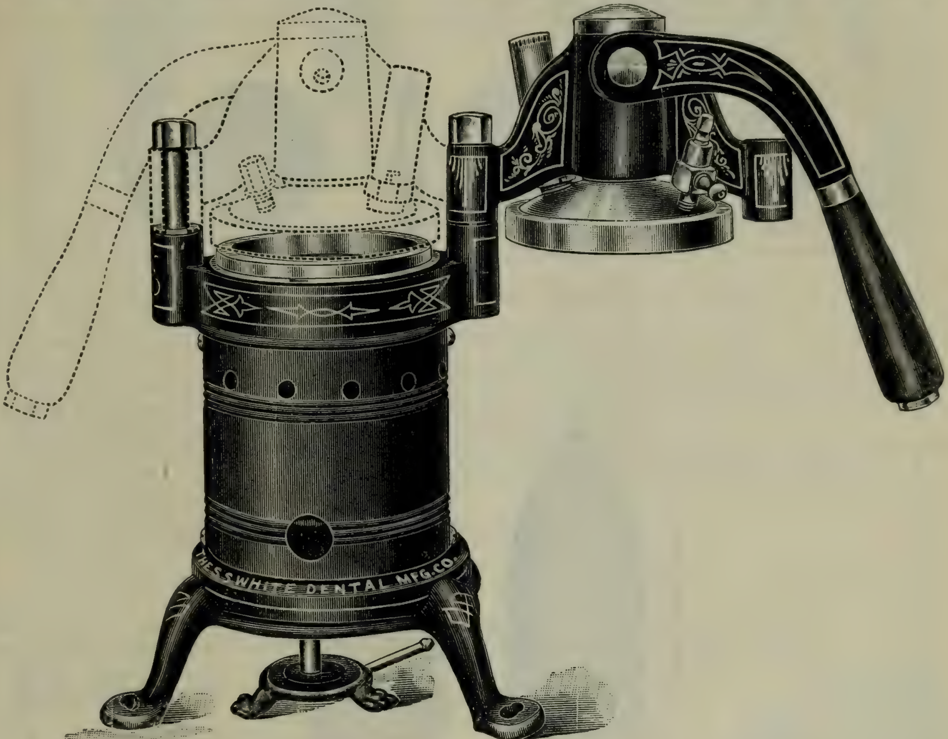
This perfected device is as simple as the alphabet. It solves all problems. A lever, easily worked, lifts and lowers the lid, swings it away from the pot, holds it clear from dirt or grit, swings it back to position, centers and clamps it. All these things it does easily and quickly:—no waste time, no undue exertion. To open or close this Vulcanizer you


THE S. S. WHITE DENTAL MFG. CO.

don't have to loosen or tighten a nut, don't have to use any sort of tool to pry off the lid. When the lid is seated, it is seated exactly.

The pot can be set in the jacket-collar in only one position, and the lid must be centered over the pot before it can be closed. It is self-centering; so you are sure that it is seated and the joint steamtight every time.

We rank this Vulcanizer among our greater triumphs,—in the class with "Revelation" Burs, the ◈ Automatic Mallet, SSW Porcelain Teeth, etc. As a mere vulcanizer it at least equals any other; superadded is this device which makes its handling a pleasure. Then, to keep up its all-around superiority, it is "made throughout the best we know how." It costs decidedly more to produce than the ordinary vulcanizer, but the comfort it will bring you will make it easily worth its price.


THE S.S.WHITE DENTAL MFG. CO.

The pot is of seamless copper, with the rim burnished over the edge of the collar and the side wall burnished into a groove in the collar; no solder about it.

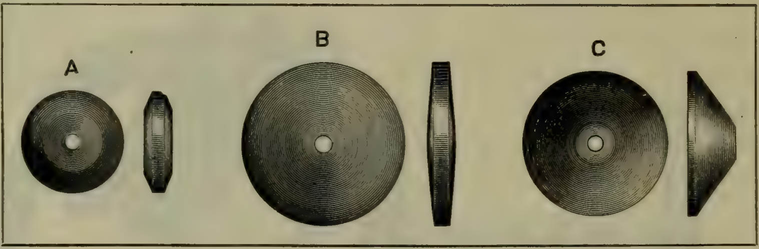
The lid carries the usual safety-cap, thermometer, and our well-known blow-off.

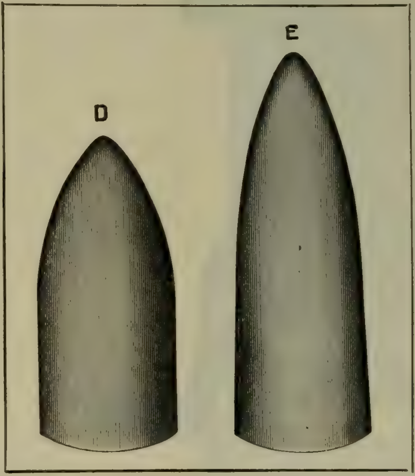
PRICES

2-Case Vulcanizer for Alcohol or Gas	$25.00	3-Case Vulcanizer for Alcohol or Gas	$27.00
" " " Kerosene	26.50	" " " Kerosene	28.50

The equipment consists of 2 wrenches, 1 pot lifter, 2 (or 3) iron "Star" flasks, 1 extra packing, 1 box of safety caps, 1 box of soapstone, with gas, alcohol, or kerosene burner as ordered.

Soft Rubber Wheels and Cones





Designed for finishing vulcanite and metal dentures.

Cones D and E will be found efficient in finishing the palatal and labial parts of the denture, and the wheels A, B, and C, for finishing between the teeth, making festoons, etc.

Wheels A, B, and C can be mounted upon mandrels No. 303 and No. 321, and then used in either the engine or lathe.

PRICES

Wheels A, B, and C	**each**	**$0.05**
Cones D and E	**"**	**.15**

SPYER'S AUTOMATIC SUCTION CAVITY

Fig. 1

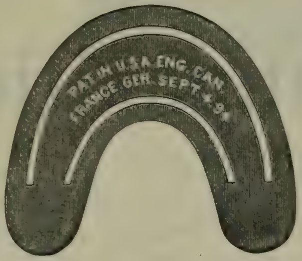


Fig. 2

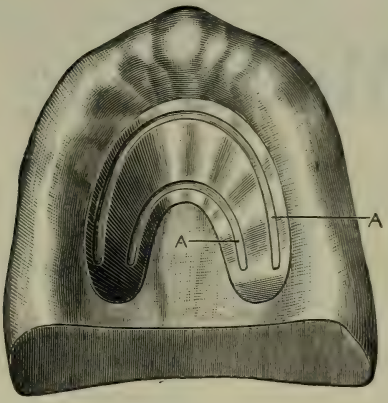


FIG. 1 is a view of Spyer's Automatic Suction Cavity ready for use. Fig. 2 shows it in position on the plaster model.

The Automatic Suction Cavity is furnished already shaped for the model; it is only necessary to trim it to meet the requirements of each case, always leaving a slight space between the slots or openings, AA, Fig. 2, and the outer margin of the metal form.

Secure the cavity by means of pins or mucilage to the plaster model on the palatal surface inside of the alveolar ridge, leaving the ridge uncovered.

Cover the metal form with the wax base-plate, which should be of the size and approximate the form of the finished plate. Upon the base-plate the teeth are set up as usual, and the case flasked, packed, and vulcanized in the usual way.

The finished plate will have along the edge of its palatal surface two ridges, besides the form of the vacuum, which provides strong adhesion from end to end of the plate.

After vulcanizing, remove the metal form. If the ridges are too high, file them down to the desired height.

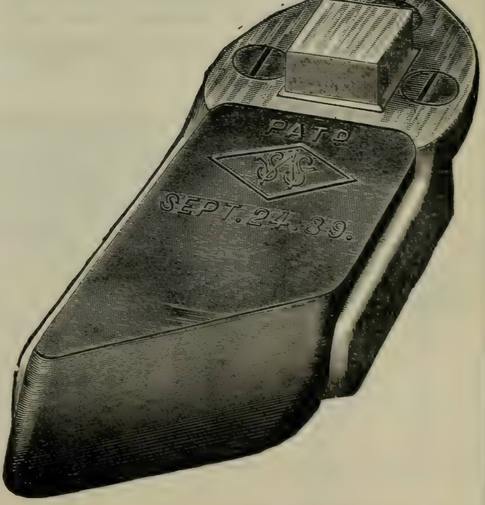
Each box contains 12 Automatic Suction Cavities.

Price . . . . per box $0.50

BENCH BLOCK

By DR. E. R. MAGNUS

[REDUCED]



THE advantages of this device are appreciable at a glance. The frame is made of cast iron (gray nickel finish), surmounted by a chilled-face anvil. It carries a thick block of par-vulcanized rubber, which for the purposes of a filing block is greatly superior to any other material. The frame can be fastened to the laboratory or office bench by the three screws which accompany it. The rubber blocks can be replaced when worn. There are two sizes; the large size is 5 inches long over all by 2¼ inches wide. The small size is 4⅜ inches long by 1⅝ inches wide.

Price, Large, complete	**each**	**$0.70**
" Small "	**"**	**.60**
Rubber Blocks, Large	**"**	**.35**
" " Small	**"**	**.25**

Modelling Composition

IS BEST

PERHAPS the characteristic of ◈ Modelling Composition which will strike most dentists most favorably is what, for the lack of a better word, we may call its "temper,"—its rigidity without brittleness. There is no danger that an impression made of it will break during its removal from the mouth.

Of course it takes a sharp, accurate impression.

Reinforcing this accuracy of reproduction is the almost complete absence of shrinkage.

An additional point in favor of ◈ Modelling Composition is its uniformity of texture. It works the same, smooth, even way all the time.

These advantages from the operator's viewpoint entirely are supplemented by others in which the patient shares his gratification.

It softens at a temperature so low as to be comfortable in the mouth.

It is slightly perfumed or flavored to make it more grateful while there.

It hardens in a reasonable time, permitting its removal before gagging supervenes.

There are plenty of places where ◈ Modelling Composition is king of all the impression materials; as, in a mouth in which there are soft spots on the ridge; in making quick models for study, of say, regulating or bridgework cases; in partial cases where there are undercuts or inclined teeth, and so on.

◈ Modelling Composition is easy to work and it gives the best of results.

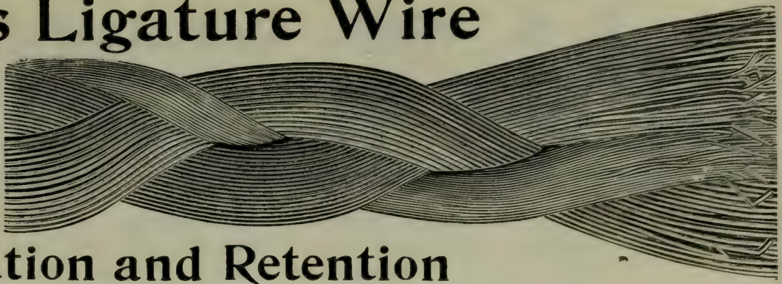
Put up in half-pound boxes. For impressions the cakes are 3¼ inches square by ¼ inch thick; for base-plates, 5¾ by 3 inches, by ¼ inch thick.

PRICES

Modelling Composition for Impressions	per lb.	$0.75
" " " " in 10 pounds	"	.65
" " " Base-Plates	per box	.63

If your dealer tries to substitute some other make, order from our nearest house.

Brass Ligature Wire for Regulation and Retention



The tough metal ligatures, made of specially drawn Brass Wire, have played an important part in orthodontia since their introduction by Dr. Angle. in 1893. The great strength of the wire, its cleanliness, freedom from slipping, its ease of adjustment, and capability of being contracted by twisting, are advantages extending the use of the ligature greatly. The sizes, the quality of metal, the temper, will commend this special wire to all who try it.

The braid contains about 100 pieces of the fine wire, and 50 each of the medium and coarse. The two larger are for regulating, the smallest for retention purposes. The pieces are a foot long to give opportunity for a firm grasp with each hand for twisting, after which the ends are cut off.

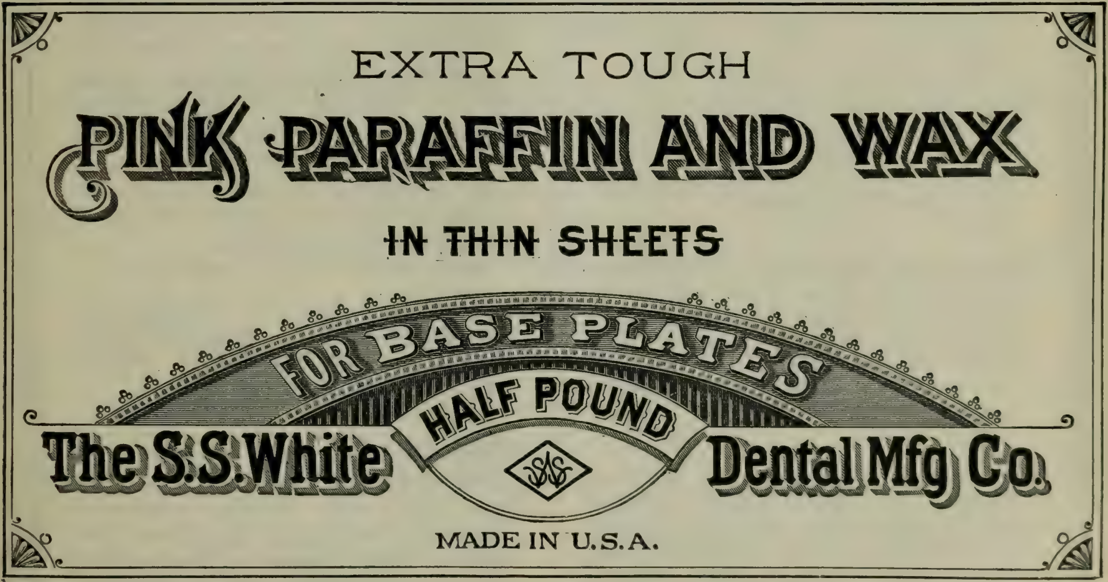
Each braid put up in a box.

Price . . . . **per box $0.50**

"Easy Flowing" Silver Solder for Dr. Angle's Regulating Appliances

To guard against the annoyance of unsatisfactory soldering in attaching parts of Regulating Appliances, Dr. Angle recommends the use of this Solder, which he has dubbed "Easy Flowing." This epithet describes one of its features. It flows easily and evenly and cleanly. It is made in our metallurgical department, of pure metals. It is uniform in its working, and has been found by Dr. Angle, after a test of many solders, to be the best adapted to this work. Put up in 5-dwt. packages.

Price . . . . **per package $0.25**



Our Extra Tough Pink Paraffin and Wax is composed of pure beeswax and paraffin.

Made in sheets 5¾ x 3 inches and put up in half-pound boxes.

Price . . . . **per box $0.50**

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It teaches the principles upon which every filling operation should be based, the steps which assure success, the pitfalls to guard against. Then it gives the technique of each in plain, intelligible language. In a word, it covers its subject completely and satisfyingly. Whoso is familiar with its teachings knows about all of value there is to be taught regarding the filling of teeth.

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" " "	**" doz.**	**4.50**

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25 per cent. H_2O_2 Ethereal

Caustic Pyrozone is a powerful and safe antiseptic and bleacher; causes no permanent injury to normal tissue. Has the special stimulating characteristic sometimes required in pyorrhea. Put up in sealed glass tubes.

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The 3 per cent. solution can only be sent by express. The 25 per cent. solution can be mailed at an additional expense of 10 cents.

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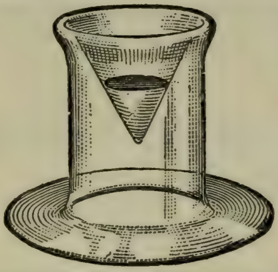

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This is a neat and handy little appliance for facilitating the application of 25 per cent. Pyrozone, Vapocaine, or other fluids in small quantities. Thus, when careful application is made in minute quantities, as with the end of the probe, there is no waste and no contamination of the original package.

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are due the dental profession of the United States, Canada, and Europe for their splendid appreciation of our efforts to serve them by reducing the price of our Alloy.

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Dr. Welch's Gold and Platina Alloy.—One Troy oz., $2.50; five ozs., $11.00; ten ozs., $20.00. Also in half-oz. packages, $1.25.

Dr. Welch's Amalgam, a silver and tin amalgam of proven value, is the best that is being offered at $2.00 per oz.; $7.00 for four ozs; $15.00 for ten ozs.

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Gold & Platina
Alloy

Why Oxyphosphate of Copper?

IN the early tests of this material in the practice of the originator, it was found that the working and embalming properties were such that cavity preparation could be much slighted, with the result of semi-decalcified dentin being changed into a very dense and sterile substance. Also that wholly decalcified organic matrix, when present as the only remaining covering for a pulp, would be transformed into an ideal capping.

Ames' Oxyphosphate of Copper will be tolerated and have a salutary effect upon normal or reasonably healthy pulp tissue.

In addition to its germicidal properties, it has great density, strength and adhesiveness, making it the most valuable plastic for filling many posterior teeth, and setting many crowns, bridges and regulating appliances.

It is the very best of plastics in the management of deciduous teeth and imperfect fissures of partially erupted permanent molars.

Manufactured by the originator
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The best antiseptic for a dentist's prescription

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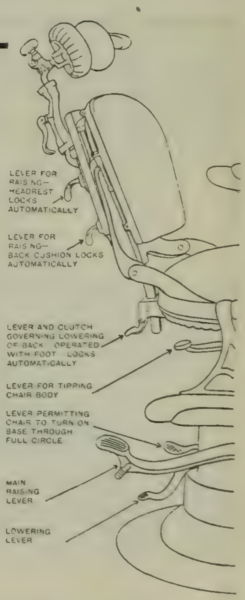
A fourth of a century of continued, satisfactory employment of Listerine has demonstrated to many practitioners that Listerine is the best antiseptic to prescribe for daily use by the patient in the care and preservation of the teeth. The mild, stimulating effect of the free boric acid radical in Listerine is of the highest importance in maintaining a healthy equilibrium of the fluids of the oral cavity. At best, alkalies simply temporarily neutralize the acid-forming ferments which the carbohydrates of food produce in the mouth—a true antiseptic prevents that fermentative change.

Literature will be forwarded upon request, containing a brief résumé of recent bacteriological investigations supporting the above argument.

Lambert Pharmacal Co., St. Louis, U. S. A.

Imperial Columbia Chair Backs lower by a new device


LEVER FOR RAISING— HEADREST LOCKS AUTOMATICALLY
LEVER FOR RAISING— BACK CUSHION LOCKS AUTOMATICALLY
LEVER AND CLUTCH GOVERNING LOWERING OF BACK OPERATED WITH FOOT LOCKS AUTOMATICALLY
LEVER FOR TIPPING CHAIR BODY
LEVER PERMITTING CHAIR TO TURN ON BASE THROUGH FULL CIRCLE
MAIN RAISING LEVER
LOWERING LEVER

which insures perfectly smooth motion.

A lever at the lower end of the back governs a clamping device which holds the back firmly in position. Pressing the foot on this lever releases the clamping device and permits the back to be lowered as wished. Releasing the lever closes the clamping device and holds the back at that position.

The clamping device is so made that the lock may be raised by simply lifting, and holds automatically. No pressure to which the back can reasonably be subjected will lower it until the clamping device is released.

These improvements permit a rapidity, convenience and smoothness of chair manipulation hitherto undreamed of. Bending over, the use of the hands and confusion of levers are avoided. Only Imperial Columbia chairs afford them.

It is sometimes very important to be able to lower or raise a chair back quickly. If you have an Imperial Columbia chair, you can do it as quickly as may be desired.

The Ritter Dental Mfg. Co.
Rochester, N. Y.

C 837

SUP - RE - NOL

Stands for all the good qualities of all other local anesthetics and the distinctive quality produced by the combination of **Suprarenal Capsules. Eight years** constant use has demonstrated the value of this ingredient and proved **SUP-RE-NOL** the best and safest local anesthetic on the market.

¶ If you are looking for **Quality with Satisfaction** it will pay you to try it.

¶ 25c. in coin will get a sample ounce.

Price: 1 oz., 75c. 12 ozs., $5.00

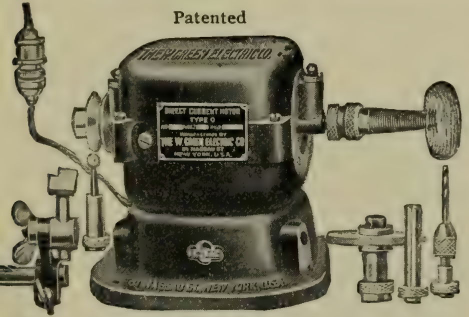
THE IDEAL CHEMICAL CO.
St. Paul, Minn. U. S. A.

Our New Dental Motor just out, The W. Green Electric Co.'s New Combination Electric

Polishing, Buffing, Drilling, Grinding, Lapping and Power MOTOR LATHE-TYPE O, 1-8 Horse Power

Made for **Direct-Current** only, for very light work. Absolutely guaranteed, instantly attached to any electric socket, always ready for immediate use, no further adjustment being required. This Motor combination comprises motor with switch for starting and stopping, buffing spindle, grindstone chuck, power pulley, adjustable plug and cord, which set will be found sufficient for moderate requirements.

Patented



Type O

NET PRICES, F. O. B. NEW YORK

	52 to 110 volts	$23.00
	115 " 250 "	25.50
Extras not always necessary	Adjustable Interior or Sandpaper Chuck	1.00
	Adjustable Drill Chuck	3.30
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	Adjustable Tool or T-Rest	3.00
	Type 2, 52 to 110 volts ⅙ H. P. rating ⅛ H. P. with 4 speeds and 5 new style chucks	27.50
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Made in order to meet the demands of a large number of **dentists, small workshops, laboratories, etc.,** who realize the great saving of time and money effected by the use of the **Electric Grinding** and **Polishing Lathe**, but from the character of their work, or the amount of investment required, or because their work is very light, do not feel warranted in purchasing an outfit as large as our 1-6 or 1-5 Horse Power.

For larger sizes of **Polishing** and **Buffing Motor Lathes** for **Direct Current**, write for Bulletin 500. For **Alternating Current**, write for Bulletin 515.

SPECIAL NOTICE.—Type O Motor **is made only for** DIRECT CURRENT **lighting system and for operating on storage or primary batteries of not less than 10 volts. The motor, by attachment to pulley, has sufficient power to operate small machinery under ordinary loads, also for Lathes, Drills, and for general Dental and Laboratory use.** NOTE.—**If your wholesale dealer cannot supply our** ELECTRIC SPECIALTIES, **write us direct. Electros, or cuts, for catalogue or advertising use furnished on application.**

Manufactured by THE W. GREEN ELECTRIC CO.,
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Names Wanted

There are a few dentists, not many perhaps and somewhat hard to find, but still a few who are not familiar with

Cotton Dental Rolls and Aseptic Dental Napkins } **Johnson & Johnson Quality**

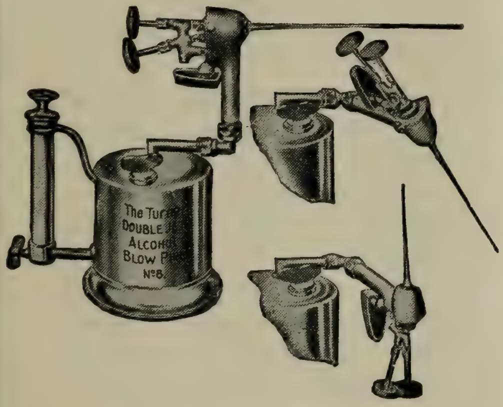
and who do not understand the many advantages to be derived in their use. They are not expected to take the place of the dam in long operations, but in simple operations they render the application of the dam unnecessary, and in the attachment of bridges and in those cases where the dam cannot be used Cotton Dental Rolls are invaluable and operations may be easily performed that it would be difficult to accomplish in any other way.

Comfort to the patient and convenience and economy to the operator are combined with other advantages. If you are not familiar with them kindly **send us your name** and we will send you samples and the pamphlet "New Hints and Suggestions for the use of Dental Absorbents." It is an ethical booklet without advertising, a text-book for dentist and student on the application of Rolls and Napkins.

Sold by leading dealers in Dental Supplies in every country in the world.
Specify Johnson & Johnson's

JOHNSON & JOHNSON
New Brunswick, N. J., U. S. A.

THE TURNER ALCOHOL BLOW PIPES



No. 8. Price $7.50. Capacity one Pint

Produce the maximum heat from either wood or grain alcohol. By an adjustment of the valves sufficient heat is produced to melt platinum solder or the heat can be reduced to the melting point of gold. The flame is needle-pointed and non-corrosive, making it excellent for all soldering. The burner of both Blow Pipes can be turned in any direction as illustrated. The blast is automatic and continuous and foot bellows are not required.

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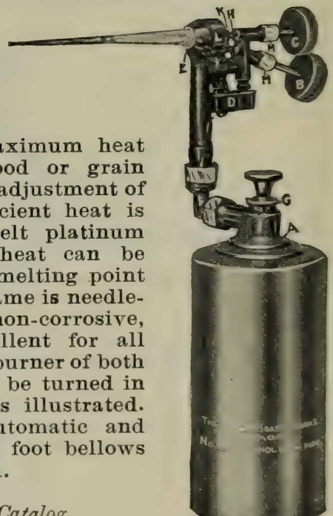

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OUR TREATISE ON PORCELAIN WORK
SENT FREE ON REQUEST

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QUALITY

IN few things is it of greater importance than in a **Local Anaesthetic,** to be sure that the Quality is right; that you can depend upon it; that your patient will have no unpleasant symptoms; that there will be no sloughing; in a word, that the Anaesthetic is both efficient and reliable.

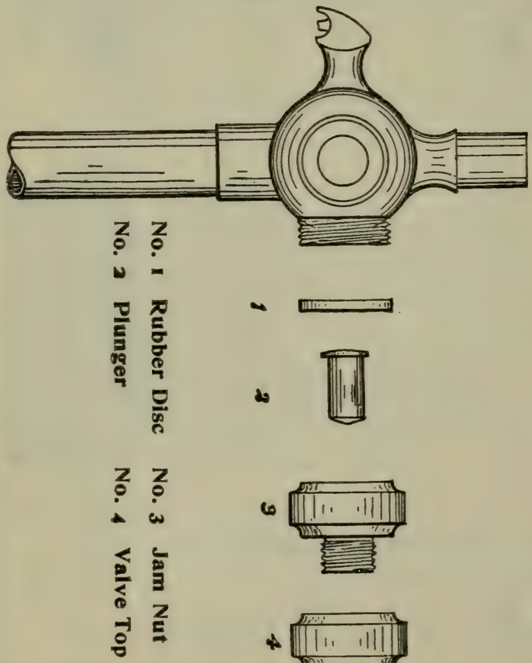
DR. R. B. WAITE'S
Antiseptic Local Anaesthetic

Will give you no uneasiness. The best proof that it is efficient is the fact that notwithstanding the number of cheap imitations, our sales have amounted to over a MILLION OUNCES during the past 12 years it has been on the market.

$1.00 BOTTLE FREE

upon receipt of 25 cents to pay for postage and packing. We keep a record of all Dentists and Physicians, and will positively only furnish one bottle in this way. If you have ever taken advantage of this offer, don't send again, your money will be returned.

Address Department M.
The Antidolar Mfg. Co., 18 Main Street, Springville, N.Y., U. S. A.



SIMPLICITY
Our Strongest Claim

To unpack the side valve of a Clark spittoon, unscrew Number 3; put new rubber washer in place. It takes one minute. Could it be more simple? . . . . . .

The complete water bowl can only be obtained successfully by using a revolving inner bowl. . . . .

A. C. CLARK & CO.
Makers . . . CHICAGO.
Sold by the up-to-date dealer all over the world.

THERE is but one satisfactory and effective disinfectant that can be used in the mouth without injury to the teeth or the soft tissues—hydrogen dioxide (Pyrozone 3% Solution).

That is the active agent produced when Calox, the Oxygen Tooth Powder, is used.

Being entirely soluble in the mouth fluids, Calox cannot injure the mouth nor form foci for deposits of calculus. It contains no vegetable fibre, no insoluble grit.

The Active Oxygen Does the Work.

Samples for personal use and for distribution to your patients sent on receipt of professional card.

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YOU probably know how well Copper-Carbo (Trade Mark Reg. U. S. Pat. Office) Cutters cut, but you may not realize that they are now made in such variety of form as to meet practically every necessity.

THE DISK FORM is made in four sizes and two forms; flat and concave, designed for cutting, grinding, and trimming natural and artificial teeth, contouring porcelain inlays, finishing fillings and separating teeth. They cut as well on the edges as on the sides; will not buckle or break, and can be sterilized without injury. Price 60 cents the set of 8, or 10 cents each, with card of instructions for use.

LONG SHANK CUTTERS are for grinding natural teeth, smoothing cavity margins, forming cavities in artificial teeth, contouring porcelain inlays and other purposes. Nine different shapes covering every requirement. 15 cents each with instructions for use.

COPPER-CARBO POWDER must be used in connection with these cutters to obtain proper results. It is a certain combination of good abrasives, making the best and cleanest powder for this purpose. Put up in screw-top jar, 15 cents.

Catalogue "A" tells all about Copper-Carbo Cutters.

Buffalo Dental Manufacturing Co.

BUFFALO, N. Y., U. S. A.

Your dealer doubtless carries Copper-Carbos.

He knows they equal Diamond Disks and Points.

Dioxogen

$H_2 O_2$ 3%

Differs from other solutions of H_2O_2 in that it is

DEPENDABLE

It is uniformly even in strength and purity and remarkable for its keeping qualities.

It is made solely for Medical, Surgical, and Dental uses, and should not be confounded with the commercial Peroxide of Hydrogen used for bleaching and other technical purposes which frequently contains impurities that are harmful and in some cases dangerous

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The Oakland Chemical Co.

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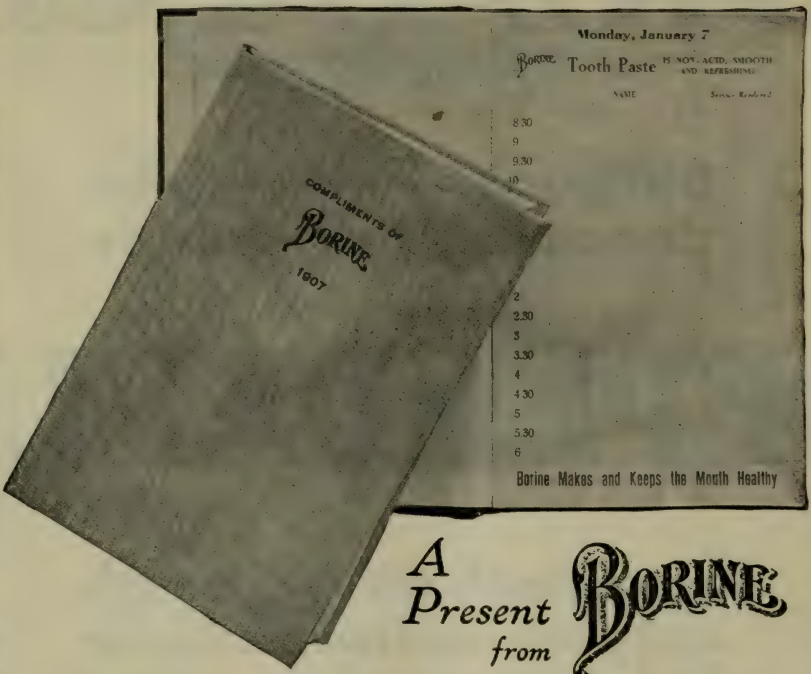
Monday, January 7
Borine Tooth Paste is non-acid, smooth and refreshing
NAME
Service Rendered
8.30
9
9.30
10
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2.30
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3.30
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5.30
6
Borine Makes and Keeps the Mouth Healthy
Compliments of
Borine
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A Present from **BORINE**

¶ **The Borine Co.** believes in advertisements equal, in point of quality, to its own product.

¶ With this thought in mind the best Appointment Book for the Dental Profession has been eagerly sought for, found, and is now ready for distribution.

We want you to have it:

THE Book has 365 pages—one for each day—printed on a good quality of writing stock, selected to take either ink or pencil. There is a place for name and "service rendered" opposite half hourly divisions of the day. It is a serviceably bound book with cloth cover, bearing only the inscription in gold "Compliments of Borine." Size 4⅛x6⅜. The book weighs 14 oz.

Sent prepaid on receipt of Twenty-five Cents

THE BORINE MFG. CO.

77 WARREN STREET NEW YORK, U. S. A.

WHEN you purchase a bottle of Wilson's Local Anaesthetic, you purchase, at the same time, immunity from all the petty annoyances that you have had from the others, and possibly from your own.

It contains all the precautions, and we tell you what they are with every bottle, and that is worth something.

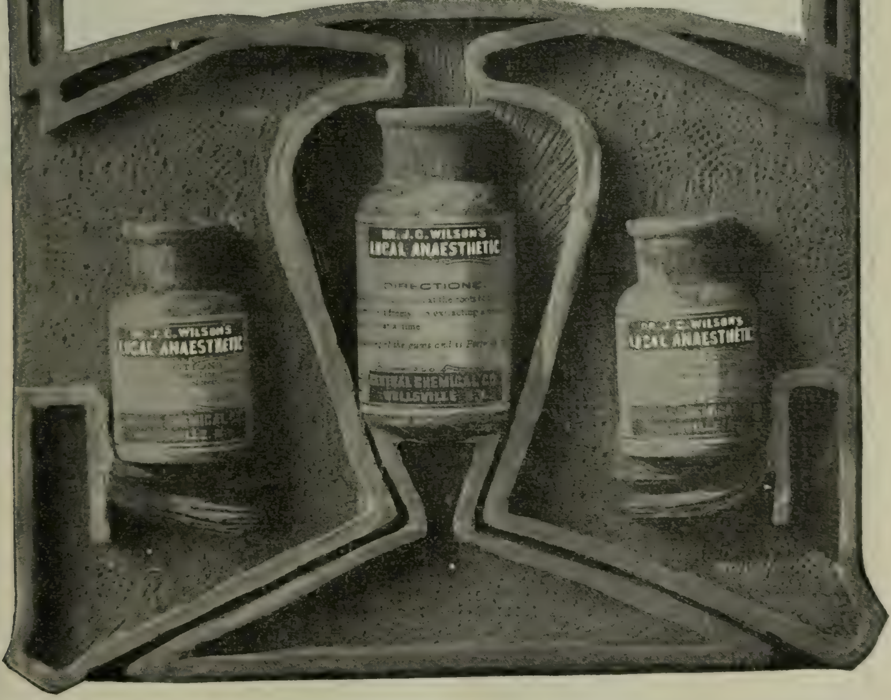
It is guaranteed to be as we say, and that, also, is worth something.

All dental depots sell it at 75c. per ounce, in one and two ounce bottles ; 6 ounces, $4.00 ; 12 ounces, $7.50.

Let us send you a sample

CENTRAL CHEMICAL CO., Wellsville, N. Y., U. S. A.

34 Rue de L'Echiquier, Paris, France.



¶ In popularity and efficiency, Sanitol Tooth Powder has rapidly become a great cleansing force in modern civilization.

¶ The food we eat—many of our habits of life—are apt to be destructive to the health of both teeth and mouth.

Sanitol Tooth Powder

uniting its *searching antiseptic qualities* with the *production of free oxygen* in the mouth, destroys every vestige of germ life and produces a gleaming, natural whiteness of the teeth. It is cooling and refreshing, a mouth tonic which tastes good long afterwards. Its use will be a pleasant revelation to you—in the immediate results.

Individual package sent FREE for trial. *Regular Size at Your Druggists 25c.*

THE SANITOL CHEMICAL LABORATORY CO. St. Louis, Mo.

High Pressure Anæsthesia

(High Pressure Anæsthesia is the Greatest Discovery in Dentistry in the past 25 years.)

HIGH PRESSURE ANÆSTHESIA is the name applied to the process of forcing an obtunding fluid through the dentinal tubuli by means of a powerful force feed syringe.

HIGH PRESSURE ANÆSTHESIA was discovered by C. G. Myers, D.D.S., of Cleveland, Ohio, in January, 1904, and was the result of six years study and experimenting.

HIGH PRESSURE ANÆSTHESIA was at first used for obtunding sensitive dentine for painlessly excavating sensitive cavities, but was later found of equal value in extirpating living pulps and in grinding teeth for crowning.

HIGH PRESSURE ANÆSTHESIA has been found superior to and has superseded all other methods of obtunding. 1st; because it is perfectly reliable and cannot fail if used intelligently. 2d; it does not require the insulation of the tooth worked on and fillings and moisture do not interfere with the working of it, as in cataphoresis. 3d; the time required to obtain perfect anæsthesia in any case is from one to two minutes. 4th; the simplicity and low cost of the apparatus place it within the reach of all.

HIGH PRESSURE ANÆSTHESIA is applied through a minute aperture drilled through the enamel of the tooth by means of a high pressure syringe or obtunder, having a tapered nozzle.

HIGH PRESSURE ANÆSTHESIA does not endanger the pulp, as the cocaine solution is not forced into it, but a very small quantity is forced onto the surface of the pulp, producing a surface anæsthesia similar to the effect produced on mucous surfaces by an external application of cocaine.

HIGH PRESSURE ANÆSTHESIA has come to stay, and even if you are not a believer in humanitarian dentistry, your patients will demand it.

HIGH PRESSURE SYRINGES were invented by Dr. C. G. Myers because no syringe was found powerful enough to produce satisfactory results.

HIGH PRESSURE SYRINGES to be effective must be so constructed that

They may be used with one hand.
They may be grasped in any position.
Contact may be easily obtained between tooth and nozzle of syringe.
Pressure may be applied without vibration.

HIGH PRESSURE SYRINGES have been placed on the market by imitators and a great many dentists have tried them and have pronounced high pressure anæsthesia a failure, whereas a perfect instrument properly applied would have given perfect results.

HIGH PRESSURE OBTUNDANT for use with high pressure syringes was devised by Dr. C. G. Myers and is in tablet form and is most effective, convenient and inexpensive.

Myers	**High**	**Pressure**	**Obtunding Outfits, $10.00, $12.50, and**	**$15.00**
"	"	"	**Obtundant, 25 Tablets**	**1.50**
"	"	"	**Points, each**	**.35**

C. G. MYERS, D. D. S.

Successor to
The Myers Dental Obtunder Co.
Schofield Building, Cleveland, Ohio

Watch each month for our ad. in the Cosmos.

ANTIPHLOGISTINE
(INFLAMMATION'S ANTIDOTE)

Is a HYGROSCOPIC, ANTISEPTIC CATAPLASM indicated in threatened alveolar abscess, gingivitis, pericementitis, pyorrhea, swellings, neuralgias, the indefinite pains following the irritation of nerves incidental to dental work and in swelling of cervical glands and tonsils occasioned by septic absorption from dental abscesses or ulcers.

It can be used externally and within the mouth simultaneously.

Sample and literature upon request.

THE DENVER CHEMICAL MFG. CO.
NEW YORK.

PLATINOID CROWN PINS

Price $1.00 per dozen

Assorted or separate sizes

All Dealers keep them

Manufactured by
Manhattan Dental Co.

Times Building
Broadway and 42d St., N. Y.

POINTED SCREWS
THREE SIZES

You can save any kind of a root, and make it useful for a Gold Crown, by strengthening it with a Crown Pin. They are tapering, with a deep-cut thread, and will cut their way into tooth-structure, making a solid foundation to build amalgam or cement around. They can also be used for extracting roots, and as posts for Richmond and other crowns, as the thread on the pin holds the cement.

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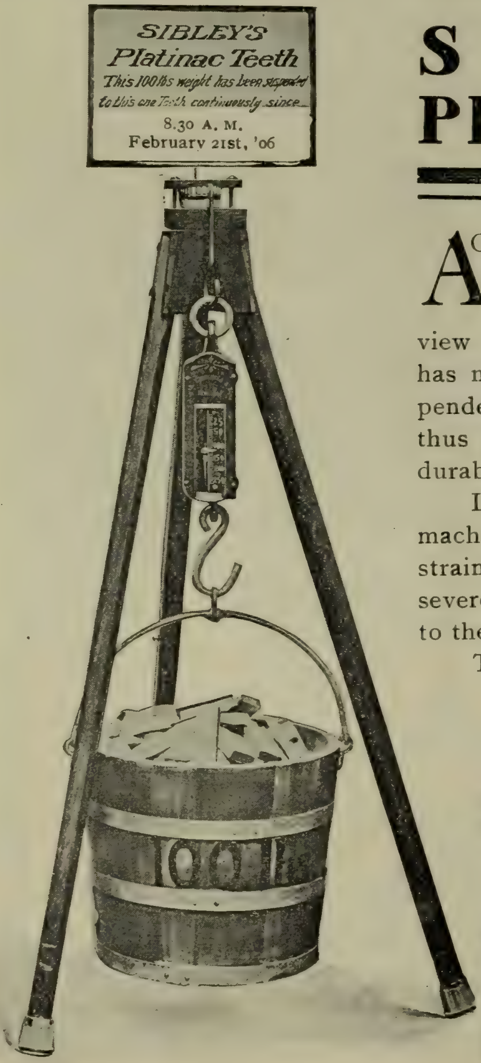
SIBLEY'S
Platinac Teeth
This 100lbs weight has been suspended
to this one Tooth continuously since
8.30 A. M.
February 21st, '06
100

SIBLEY'S
Platinac Teeth

AGAIN we call your attention to the test here illustrated which is shown in our salesroom in plain view of anyone passing. This one tooth has now stood this test of 100 lbs. suspended to it for over nine months, thus proving their superior strength and durability.

Last month we illustrated a testing machine with which we test them by direct strain on the pins. We know of no more severe test that might in reason be applied to them.

Try **PLATINAC** Teeth and you will become one of their advocates.

PRICES
FOR RUBBER WORK ONLY

Set of 14, 85 cents — $50.00 Lots 65 sets
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Subject to spot cash discounts as follows:
$5.00 to $25.00, 3%; $25.00 to $100.00, 5%; $100.00 or over, 10%

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(and, of course, for certain purposes you must) you want the best, don't you? Then why not decide the question by a real test?

Order a package of CAULK'S COPPER CEMENT from your dealer, test it in your practice, and then, if you want to return it, do so and get your money back.

Price, $1.50

If you prefer, we will send you a sample, but a package will enable you to judge its merits more fully. Your dealer has it, and probably supplies your competitor.

It is a germicide, is remarkably tenacious; it arrests decay. In many instances it proves to be a permanent filling. It deserves a wider use.

Manufactured by THE L. D. CAULK CO.
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ATLAS DENTAL LABORATORY Co.

INCORPORATED

W. J. TRUMPOUR, MGR.
PHONES: CENTRAL 1780. AUTOMATIC 5780.
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THE largest exclusive dental laboratory in the world. By exclusive we mean that we devote all our efforts to the laboratory business, and do it well, instead of doing a dozen different things poorly. Any dentist can readily understand the difference.

We have just issued a new catalogue of prices, and we want every dentist to have one. We know it to be to their interest to have one. We have mailed about 18,000 of them, but may have missed you. If we did, advise us at once and one will be forwarded. We want you to see our prices. Just a trifle over cost of materials.

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For Instruction In

Crown and Bridge Work

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Closed during month of September

A permanent school for Post-Graduate work in removable and fixed Crown and Bridge practice.

A thorough training in the technique of Preparation of supports and abutments, the most important part of this work, is assured. The practical application of porcelain to Crown and Bridge work will also form a prominent feature of the course.

Length of Course, six weeks.

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The Next Session begins Oct. 29, 1906. The class will be limited to twenty members.

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A THREE-YEAR COURSE

A perfectly equipped dental college

Large and varied clinic, affording our students an abundance of practical experience

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MEMBER OF NATIONAL ASSOCIATION OF DENTAL FACULTIES. RECOGNIZED BY NATIONAL ASSOCIATION OF DENTAL EXAMINERS

Tuition fee $100 for 1906-07

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DETROIT COLLEGE OF MEDICINE

Department of Dental Surgery

DETROIT, MICHIGAN

Member of National Association of Dental Faculties, and recognized by the National Board of Dental Examiners

ESTABLISHED 1891

THE SIXTEENTH ANNUAL SESSION will begin September 19, 1906, and continue nine months.

THREE FULL COURSES OF STUDY of nine months each are required for graduation.

FEES: ***Matriculation, $5.00*** ***Regular Course, $60.00*** ***Graduation, $30.00***

A perpetual ticket (not transferable), good for three or more courses, will be issued for $150.00

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The Baltimore College of Dental Surgery

THE OLDEST DENTAL COLLEGE IN THE WORLD

CHARTERED BY THE LEGISLATURE OF MARYLAND IN 1839

The Baltimore College of Dental Surgery, the first and for many years the only dental school, offers facilities for the study of dentistry proper, such as age and experience only can give. Its immense museum, complete apparatus, large and well-arranged building, and carefully studied curriculum, give to its students great advantages and opportunities, both theoretical and practical, while its age gives its diploma a dignity far outranking all other colleges,—a diploma honorably represented in all civilized countries, and held by the most distinguished members of the dental profession.

The fact that dentistry must be practically taught is fully recognized, the College Infirmary, a most complete, large and handsome hall, being daily filled with clean and respectable patients, of a class nearly equal to those of the average dentist. The Infirmary is open all the year. For Summer Session, no charge to those who attend the following Winter Session.

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Commencing October 1, 1895, women will be admitted to this College, subject to the same requirements as men.

The College has formed an alliance with the College of Physicians and Surgeons by which its students are privileged to attend all lectures and clinics. The patients of this medical school numbered last year over 40,000.

The qualifications for entering the first year's course are in accordance with the resolutions adopted by the National Association of Dental Faculties.

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FEES.—Matriculation (paid once only), $5.00. Tuition fee, $150.00. Diploma fee, $30.00. Dissecting fee (paid once only), $10.00.

Students corresponding with the Dean will be careful to give full address, and direct their letters to

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Creighton University Dental College

210 South 18th Street, Omaha, Nebraska

This college is the most modern equipped Dental College in the United States. Centrally located in the business district of the thriving city of Omaha, an abundance of clinical material is always assured. Instruction is complete in every detail. Thirty-five professors and assistants compose the faculty. Winter session opens October 2d, 1906, and closes the latter part of May, 1907. For catalogue and all information, address The Creighton University Dental College, 210 South 18th Street, Omaha, Nebraska.

INDIANA DENTAL COLLEGE
INDIANAPOLIS, INDIANA

The twenty-eighth annual session began October 1, 1906 and the Twenty-ninth session will begin September 30, 1907.

A college combining the experience of years with the modern teaching of up-to-date experts.

Four members of our faculty devote their entire time to the College and are always with the students during college hours.

For catalogue and other information, address the College, as above.

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DEPARTMENT OF DENTISTRY
NASHVILLE, TENN.

A well-located school, thoroughly equipped and honorably conducted, where conscientious instruction and modern methods fully warrant the assumption that

Students of Dentistry

cannot do better than attend it.

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University of California
College of Dentistry
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Twenty-fifth Session will commence Sept. 10, 1906

Send or
Announcement to
Dr. Jas. G. Sharp, Dean
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Harvard University

DENTAL DEPARTMENT

▲ ▲ ▲ Boston, Mass.

THIRTY-EIGHTH YEAR BEGINS SEPTEMBER 27, 1906

SEND FOR ANNOUNCEMENT

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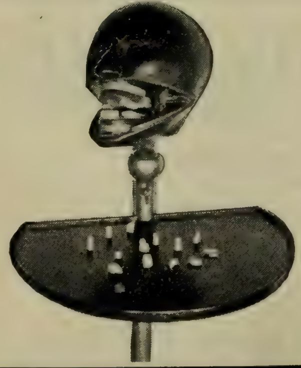

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